EMS Core Measures Project

Reporting Capability of EMSA and LEMSA Data Systems

and

Results from Performance Measures

Data Year 2015

With Comparison to Years 2013 and 2014

May 2016

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Contact Information for: The 2015 EMS Core Measures Project
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EMS Core Measures Project, Reported 2015: Reporting Capability of EMSA and LEMSA Data Systems and Results from Clinical Measure Reports

Introduction

Emergency medical services (EMS) provide timely and appropriate emergency medical care and transportation of the ill and injured, thereby reducing morbidity and mortality. EMS is an integral part of every community's emergency health care delivery system, and quality improvement (QI) practices must become an essential part of EMS systems. Evaluation of standard clinical and response performance indicators is a crucial component of a quality improvement program to ensure that EMS services operate safely and effectively and follow evidence based clinical practices to maximize outcomes.

Robust data systems, with the ability to report clinical indicators and performance measures, are a key tool to accomplish QI activities. The continuum of care from dispatch to pre-hospital to hospital disposition must be connected in order to optimally evaluate patient outcomes.

Background and Authority

California is a large, diverse state with a two-tier regulatory system consisting of State Emergency Medical Services Authority (EMSA) and 33 local EMS agencies (LEMSA). California statute (Health and Safety Code 1797.103) maintains that one of the required elements of an EMS system is data collection and evaluation, and mandates the establishment and development of quality improvement guidelines. Local EMS agencies are required to plan, implement, and evaluate an EMS system (CCR Title 22 Division 9 Chapter 12). As such, they are charged with the responsibility for establishing a data collection system and setting data and QI standards at the local level. Additionally, the EMS system QI regulations define the requirements for LEMSAs, EMS service providers, and base hospitals. These requirements include, but are not limited to, the implementation of an EMSA approved EMS Quality Improvement Program (requiring data reporting) and the use of defined indicators to assess the local EMS system as defined in CCR, Title 22, Division 9, Chapter 4, Section 100147, 100169, 100170.

Methodology

A task force consisting of key data and quality leaders from local EMS agencies, medical directors, hospitals, and pre-hospital EMS providers assisted in the development of these core measures (17 clinical and 3 related to response and transport). The measures are based on evidence-based processes and treatments for a condition or illness. Core measures are intended to help EMS systems improve the quality of patient care by focusing measurement specifications on key processes and results of care. *The California EMS System Core Quality Measures, EMSA 166, Appendix E* defines the specific data elements and instructions for reporting each measure. The measures are refined each year to improve results. For example, changes were made to the both of the trauma measures (TRA-1 and TRA-2) to be more consistent with the CDC Trauma Triage Criteria.

LEMSA participation in the statewide EMS data system, California Emergency Medical Services Information System (CEMSIS), is required consistent with HSC 1797.102 in

providing the EMS Authority with information necessary to access the effectiveness of emergency medical services in each EMS area or the system's service area. The EMS Authority tasked the LEMSAs with the extraction and submission of core measure reports based on their local databases. Each of the 33 LEMSAs maintains their databases independent of one another, resulting in variability in their ability to report core measures and some intrinsic variation in validity. While sampling is an approved mechanism for the LEMSAs to calculate core measure values and has been done in the past, no LEMSAs reported sampling this year.

In addition to reporting core measure information, EMSA requested that each of the LEMSAs with the intent of gaining insight into the process of collection and reporting of their information.

Please include in your data flow description:

- *Paper Patient Care Records (PCRs)*
  - *How many providers are using paper PCRs;*
  - *How the data from the paper PCRs are being entered into the system from those providers;*
- *Electronic Paper Patient Care Records (ePCRs)*
  - *How many providers are using electronic PFCRs;*
  - *How the data form the ePCRs are being entered into the system;*

- *A general description of your data system to include:*
  - *A general idea of the data flow from the providers to EMSA;*
  - *Who compiles the data for the Core Measures Reports (LEMSA staff, contractor, provider, etc.;*
  - *Who submits the Core Measures Reports to EMSA;*
  - *Who compiles the data for the Core Measures Reports (LEMSA staff, contractor, etc.); and*
  - *Any other information that would help us better understand the Core Measures data submitted*

Of those who responded, 20 of 29 LEMSAs provided a response to the preliminary questions. Only 9 of the 29 LEMSAs provided the description of the flow of data.

Limitations and Challenges

Core measure reporting is a recent project that depends on the development of compatible data systems at several levels of the EMS system and will take several more years to achieve the level of confidence of other healthcare sector quality assessment reporting. EMSA plans to continue to work on these measures to improve the validation, data collection, and reporting processes and to connect them to "best practices". The LEMSAs encounter challenges in reporting the core measures to EMSA, which are enumerated below. Of the 33 LEMSAs, 29 were able to report at least one clinical measure for 2015 data. A national initiative (http://www.emscompass.org/) began in 2015 to develop performance measures with several California representatives on various committees. With the upcoming transition to NEMSIS 3, EMSA expects an increase in the quality of data collected and improvements to reported values for the performance measures.

Data Collection and Reporting Limitations

New data systems - Some of the LEMSAs recently migrated to new data systems and the prior data were no longer available or the LEMSA was unable to incur the costs of retrieving the data. This problem was noted in the first year of the project, and has continued to be a barrier in the second and third years as others transition.

Variability in data collection methodology – In a 2013 Health Information Exchange Readiness Survey conducted by Lumetra, ten of 32 EMS systems reported use of paper-based pre-hospital care reports (PCR) by at least one provider in their region. Abstracting information from paper forms is difficult, time-consuming, and not necessarily accurate. This has been a significant barrier in the first three years and will continue to be a problem until all providers and LEMSAs are using electronic patient care record (ePCR) with software that has a high degree of technological sophistication, including rules that forces users to complete forms before closing the record.

Hospital Outcome Data – One of the clear challenges identified this year, as in the first two years, was the difficulty in obtaining hospital outcome data on every ambulance transport. Several measures rely on the hospital to report survival to emergency department discharge and survival to hospital discharge. While the response rate increased for specific cardiac arrest outcome measures (CAR- 3 and CAR-4), EMSA and the LEMSAs must continue efforts to acquire this information.

Transition from NEMSIS 2 to 3

This transition is a lengthy and costly process that directly impacts specific data definition. Most importantly, it will hinder the ability to conduct comparative analysis due to the variance in how quickly each LEMSA moves to NEMSIS 3.

Future Data Legislation

Recent state legislation is driving changes in EMS data systems related to data quality and data accuracy. Specifically, four bills were enacted in 2015 and became effective January 2016. These include:

- AB 1129 which requires each provider to utilize electronic health record systems that are compliant with the "current version of NEMSIS" to collect EMS data;
- AB 503 which authorizes a health facility to share patient-identifiable information with EMSA or other appropriate EMS entities for the purposes of addressing quality improvement;
- AB 1223 which requires EMSA to adopt standards related to data collection for ambulance patient off-load time; and
- SB 19 which requires EMSA to establish a pilot project to be known as the California POLST eRegistry for the purpose of collecting information received from a physician or their designee.

Each of these new laws may have some impact on the Core Measures effort, particularly AB 1129 and AB 1223.

Project Design Limitations

Aggregate data - The data provided are aggregated summary data reported by each LEMSA, which limits the types of analyses that can be done. More in-depth statistical analyses could be performed if patient-level data were collected and analyzed by EMSA.

Data quality and reliability -There are many differences in data collection and reporting practices across LEMSAs. This lack of data standardization and consistency further limits reliability and comparability of the measures reported by each LEMSA. Though all LEMSAs were given the same specifications to calculate the measures, not all are able to adhere to these due to constraints and inconsistencies in data collection and measure calculation methods. Greater data standardization will lead to results with greater validity and comparability. Unless data quality checks or audits are performed by LEMSAs before measures were calculated and submitted, the accuracy of the data cannot be ascertained. This is compounded where there is manual data entry.

Documentation by Non-Trained Providers - EMS field personnel did not receive core measures specific training prior to data entry. Consequently, responders likely did not consistently record all the data elements required for core measures. Additional education and training will reduce this problem. EMSA will work with the LEMSAs to alert providers of the specific elements in core measures data to ensure that those fields are properly populated. New ePCR software has rules that can mandate and can limit values for key fields. This can be integrated into quality improvement plans to help with quality assurance in the future. Optimally these will be standardized statewide.

Patient Records in Tiered EMS systems - One of the significant challenges of reporting EMS information is related to the dual EMS response system in most geographic areas. Two records are often initiated for each patient: one by EMS first responders and a second by ambulance transport units that arrive later. LEMSAs have not established a mechanism—either manually or technologically—to create an integrated record that captures the full treatment provided to a single patient. This inability to aggregate first responder data with transport provider data could lead to a conclusion that care was not provided, when in fact, it may have been provided to the patient by a different provider. This is a critical procedural issue and highlights the need for a “one patient, one record” system to allow for a complete picture of patient care. EMSA, LEMSAs, and providers continue to explore potential solutions to this challenge.

Partial System Representation – Only a portion of the actual EMS business conducted in California is represented in this report. Since not all providers are using electronic data collection (some providers are still using paper patient records), the values reported by the LEMSAs are not representative of 100% of the providers in the state. EMSA is working with the LEMSAs to assist the providers in shifting from paper patient care records to ePCR systems. One way this is being done is through local assistance grant opportunities.

In future years, system improvements that will facilitate data collection and more accurate reporting include:

1. Additional LEMSAs successfully exporting data to CEMSIS
2. CEMSIS accumulating sufficient records to generate reports on core measures
3. Transition from NEMSIS Version 2 to NEMSIS Version 3, an updated national data dictionary.

Improvements

While the number of LEMSAs who submitted core measure values to EMSA decreased from the prior year (29 of 33 submitting at least one clinical measure), the number of measures that each LEMSA reported increased dramatically (see Chart 2 “Histogram”).

The following 7 (seven) measures experienced an increase in their median reported value from the previous year:

- TRA-1
- TRA-2
- ACS-1
- CAR-4
- STR-2
- STR-3
- SKL-2

Tables, Charts and Graphs Generated from LEMSA Reporting of Core Measures

LEMSAs Reporting Data for Any Core Measures (Table 1):
Table 1 shows which LEMSAs submitted any core measures for data years 2009-2015. If a LEMSA was able to submit a value for any of the 17 clinical measures or the 3 (three) Response and Transport measures found in *California EMS System Core Quality Measures, EMSA 166, Appendix E*, the cell associated with that data year will be populated with an "X" and will be filled green. For LEMSAs that did not submit any core measure information to EMSA, their cell for that corresponding year appears white. 29/33 LEMSAs reported at least one measure.

Clinical Measures Response Count, Denominator Total, Submission Rate, Average, and Median as Reported by LEMSA (Table 2):
This table features the number of LEMSAs who reported a value for the specific clinical measure, the denominator total (number of patient records) of all responses, Submission Rate, Average Reported Value, and Median Value for all responses. This table includes 2012, 2013, 2014 and 2015 information.

Frequency Histogram of LEMSA Number of Responses to Clinical Measures (n=17) for 2012-2014 (Chart 1) and **LEMSA Response Count to 17 Clinical Measure for 2014 Data (Chart 2)**
The histogram shows the LEMSAs ability to report the 17 clinical measures. It features the number of LEMSAs able to respond to the clinical measures grouped ranges as follows: 17-15, 14-12, 11-9, 8-6, 5-3, 2-0. Each of the 33 LEMSAs is tallied in one of these groups based on how many clinical measures they were able to report. Chart 2 illustrates the number of clinical measures each of the LEMSAs were able to report and is organized alphabetically.

Clinical Measure Results:
This report includes the LEMSA responses to the clinical measures as they were reported to EMSA. Each measure includes a graph (based on the reported value provided by each LEMSA and the median value for all submissions ("Part 1 of 2"). On the following page ("Part 2 of 2") the report features a table of the reported values for the clinical measure as well as the denominator population considered for this measure. The table is populated directly from the values provided to EMSA by the LEMSAs. If a LEMSA was unable to report a measurement or denominator value, the cell in that row will be contain no value and is shaded grey. In addition, "Part 2 of 2" features the LEMSA response count, Denominator Total, Submission Rate, Average Reported Value, and Median Value for all responses. The median values for the prior year's reporting are found in the top right corner of the page, and a yellow box features some commentary on the measure and responses.

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LEMSAs Reporting Data for Any Core Measure (Table 1)

Core Measure Reporting by LEMSA

	2009	2010	2011	2012	2013	2014	2015
Alameda County EMS		X	X	X	X	X	X
Central California EMS	X	X	X	X	X	X	X
Coastal Valleys EMS				X	X	X	X
Contra Costa County EMS		X	X	X	X	X	X
El Dorado County EMS				X	X	X	
Imperial County EMS							
Inland Counties EMS	X	X	X	X	X	X	X
Kern County EMS		X	X		X	X	X
Los Angeles County EMS	X	X	X	X	X	X	X
Marin County EMS		X	X		X	X	X
Merced County EMS	X	X	X	X	X	X	X
Monterey County EMS		X	X	X	X	X	X
Mountain Valley EMS		X	X	X	X	X	X
Napa County EMS					X	X	X
North Coast EMS		X	X	X	X	X	X
Northern California EMS	X	X	X	X	X	X	X
Orange County EMS					X	X	X
Riverside County EMS		X	X	X	X	X	X
Sacramento County EMS		X	X	X	X	X	
San Benito County EMS					X	X	X
San Diego County EMS		X	X	X	X	X	X
San Francisco EMS	X	X	X	X	X	X	X
San Joaquin County EMS				X	X	X	X
San Luis Obispo County EMS		X	X		X	X	X
San Mateo County EMS		X	X	X	X	X	X
Santa Barbara County EMS	X	X	X		X	X	X
Santa Clara County EMS	X	X	X	X	X	X	X
Santa Cruz County EMS	X	X	X		X	X	X
Sierra-Sacramento Valley EMS	X	X	X	X	X	X	X
Solano County EMS				X	X	X	
Tuolumne County EMS		X	X	X	X	X	X
Ventura County EMS		X	X	X	X	X	X
Yolo County EMS					X	X	X
Totals Measure Responses (including RSTs and 2015 Measures)	10	24	24	23	32	32	29

Reported At Least 1 Measure

No Measures Submitted

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Clinical Measures Response Count*, Denominator Total, Submission Rate, Average, and Median as Reported by LEMSA (Table 2)

Measure Response Count, Submission Rate, Average, and Median

2012

Measure ID	TRA-1	TRA-2	ACS-1	ACS-2	ACS-3	ACS-5	CAR-2	CAR-3	CAR-4	STR-2	STR-3	STR-5	RES-2	PED-1	PAI-1	SKL-1	SKL-2
Response Count	17	17	22	22	20	21	21	11	10	22	20	16	21	20	16	21	20
Denominator Total	14918	12185	90238	75642	11523	11598	10023	7991	7446	33872	34197	20822	52807	2829	135417	9130	6100
Submission Rate (n=32)	51.52%	51.52%	66.67%	66.67%	60.61%	63.64%	63.64%	33.33%	30.30%	66.67%	60.61%	48.48%	63.64%	60.61%	48.48%	63.64%	60.61%
Average	0:22:40	68.91%	60.36%	71.21%	0:23:00	79.56%	23.56%	24.01%	10.87%	66.02%	0:21:49	55.39%	56.28%	60.98%	53.44%	79.23%	72.51%
Median	0:21:48	70.30%	57.23%	78.80%	0:23:36	92.00%	25.00%	24.00%	10.62%	76.12%	0:22:24	72.67%	64.00%	68.80%	36.70%	80.45%	85.32%

25 Total Submissions considered in this table

2013

Measure ID	TRA-1	TRA-2	ACS-1	ACS-2	ACS-3	ACS-5	CAR-2	CAR-3	CAR-4	STR-2	STR-3	STR-5	RES-2	PED-1	PAI-1	SKL-1	SKL-2
Response Count	23	25	27	28	28	27	27	12	11	27	26	20	27	27	19	25	22
Denominator Total	16382	9481	108544	118811	13587	11316	16825	14242	14026	34364	31196	23389	62830	5254	131130	11930	10032
Submission Rate (n=33)	69.70%	75.76%	81.82%	84.85%	84.85%	81.82%	81.82%	36.36%	33.33%	81.82%	78.79%	60.61%	81.82%	81.82%	57.58%	75.76%	66.67%
Average	0:22:20	70.01%	65.51%	75.90%	0:22:36	75.56%	28.90%	28.82%	10.82%	81.88%	0:21:03	69.80%	58.48%	56.96%	45.18%	74.61%	71.34%
Median	0:22:00	82.00%	67.34%	80.80%	0:22:44	91.53%	25.25%	30.12%	11.53%	87.00%	0:20:10	86.00%	61.59%	64.18%	33.23%	75.57%	78.86%

31 Total Submissions considered in this table

2014

Measure ID	TRA-1	TRA-2	ACS-1	ACS-2	ACS-3	ACS-5	CAR-2	CAR-3	CAR-4	STR-2	STR-3	STR-5	RES-2	PED-1	PAI-1	SKL-1	SKL-2
Response Count	28	27	31	31	29	28	30	12	12	31	30	21	29	29	22	30	29
Denominator Total	59496	108682	111161	109520	9396	7826	16759	8773	9637	32810	31483	25478	79440	5453	117381	9898	7605
Submission Rate (n=33)	84.85%	81.82%	93.94%	93.94%	87.88%	84.85%	90.91%	36.36%	36.36%	93.94%	90.91%	63.64%	87.88%	87.88%	66.67%	90.91%	87.88%
Average	0:24:21	61.90%	66.55%	81.48%	0:21:22	87.82%	27.68%	27.00%	9.26%	80.09%	0:21:20	74.55%	60.47%	54.34%	41.65%	71.68%	74.60%
Median	0:24:30	81.02%	63.00%	87.86%	0:21:37	96.86%	24.54%	23.50%	8.51%	89.80%	0:20:43	93.00%	67.69%	60.62%	39.00%	72.87%	91.00%

31 Total Submissions considered in this table

2015

Measure ID	TRA-1	TRA-2	ACS-1	ACS-2	ACS-3	ACS-5	CAR-2	CAR-3	CAR-4	STR-2	STR-3	STR-5	RES-2	PED-1	PAI-1	SKL-1	SKL-2
Response Count	27	26	29	29	27	28	29	11	11	29	26	22	27	27	25	28	28
Denominator Total	14036	19456	98274	101450	18553	13703	16577	7750	6828	30254	25155	26212	116267	8614	251438	9629	7170
Submission Rate (n=33)	81.82%	78.79%	84.85%	84.85%	81.82%	81.82%	84.85%	33.33%	33.33%	84.85%	75.76%	63.64%	81.82%	81.82%	75.76%	81.82%	81.82%
Average	0:23:49	70.04%	66.28%	80.97%	0:22:27	81.83%	26.08%	25.65%	12.38%	84.91%	0:20:24	69.48%	45.88%	43.51%	39.51%	72.73%	75.79%
Median	0:23:44	83.37%	66.00%	85.81%	0:23:07	95.85%	24.06%	18.31%	10.50%	92.90%	0:20:29	89.00%	37.21%	29.00%	32.40%	73.37%	88.25%

29 Total Submissions considered in this table

*Response Count is defined as the number of LEMSAs who submitted a reported value for the specific measure

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Fifteen of the seventeen measures had a 75% response rate or greater. The following measures were reported by at least 25 of 33 LEMSAs (75%):

1. TRA-1 Scene time for trauma patients
2. TRA-2 Direct transport to designated trauma center for trauma patients meeting criteria
3. ACS-1 Aspirin administration for chest pain/discomfort rate
4. ACS-2 12 lead ECG performance
5. ACS-3 Scene time for suspected heart attack patients
6. ACS-5 Direct transport to designated STEMI receiving center for suspected patients meeting criteria
7. CAR-2 Out-of-hospital cardiac arrests return of spontaneous circulation
8. STR-2 Glucose testing for suspected acute stroke patients
9. STR-3 Scene time for suspected acute stroke patients
10. STR-5 Direct transport to stroke center for suspected acute stroke patients meeting criteria
11. RES-2 Beta2 agonist administration for adult patients
12. PED-1 Pediatric patients with wheezing receiving bronchodilators
13. PAI-1 Pain intervention
14. SKL-1 Endotracheal intubation success rate
15. SKL-2 End-tidal CO2 performed on any successful endotracheal intubation

Measures with the lowest response rate include:

16. CAR-3 Out of hospital Cardiac Arrest Survival to Emergency Department Discharge
17. CAR-4 Out of hospital Cardiac Arrest Survival to Hospital Discharge

Additional, non-clinical measures absent from this report include:

18. RST-1 Ambulance response time by ambulance zone (emergency)
19. RST-2 Ambulance response time by ambulance zone (non-emergency)
20. RST-3 Transport of patients to hospital

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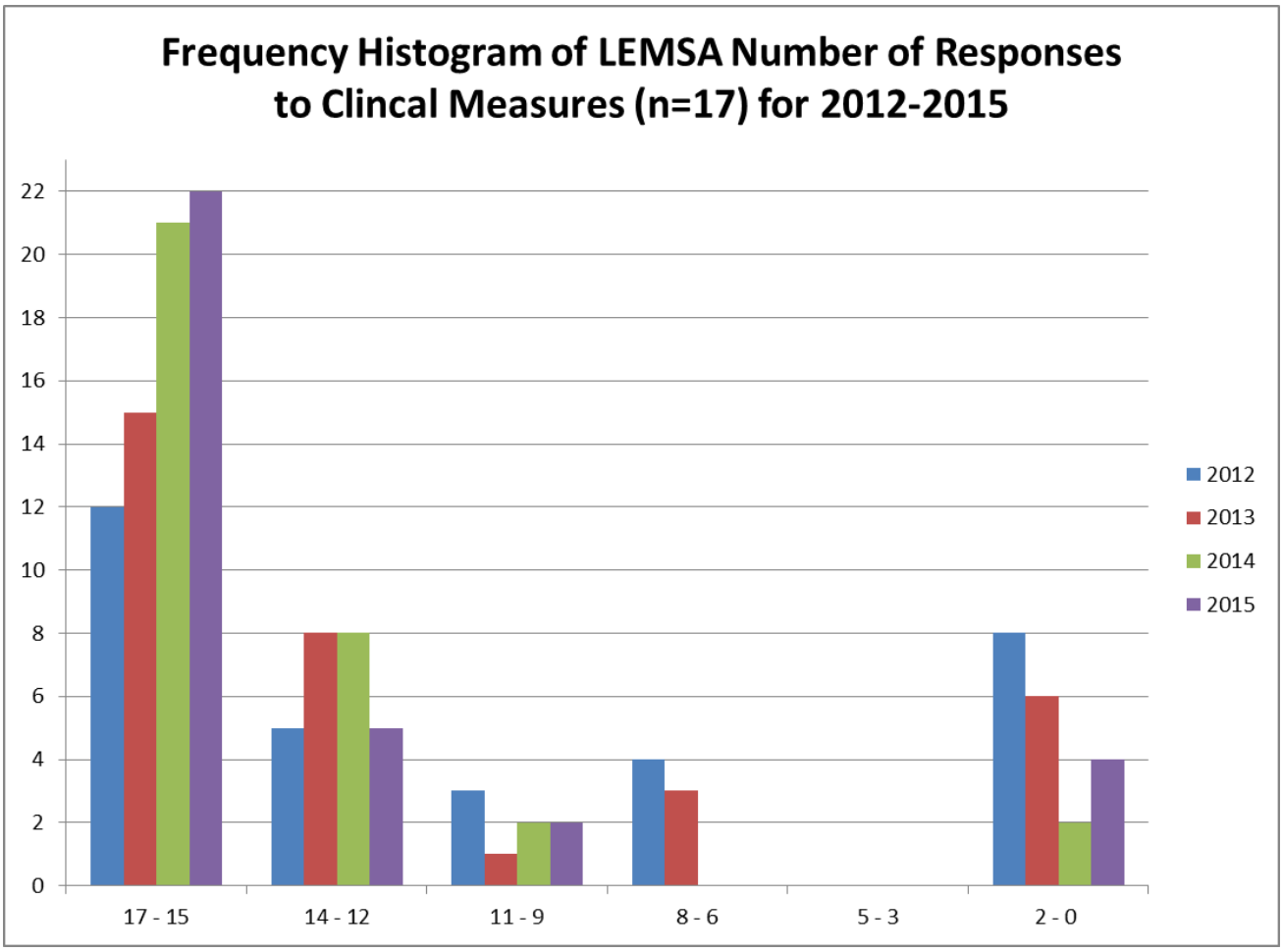
LEMSA Responses to Clinical Measures

Of interest is how many clinical measures could be evaluated by the LEMSAs. Out of the seventeen clinical measures, 29 of 33 LEMSAs (93%) were able to report at least nine, based on their 2014 data.

The ability to report these measures is not indicative of a LEMSAs commitment to data collection or quality improvement. Rather, it is an indicator of the ability of the LEMSA data system to report retrospective clinical data, with the limitations previously mentioned.



Count of LEMSA reporting a value noted in the calendar year

Bin	2012	2013	2014	2015
17 - 15	12	15	21	22
14 - 12	5	8	8	5
11 - 9	3	1	2	2
8 - 6	4	3	0	0
5 - 3	0	0	0	0
2 - 0	8	6	2	4

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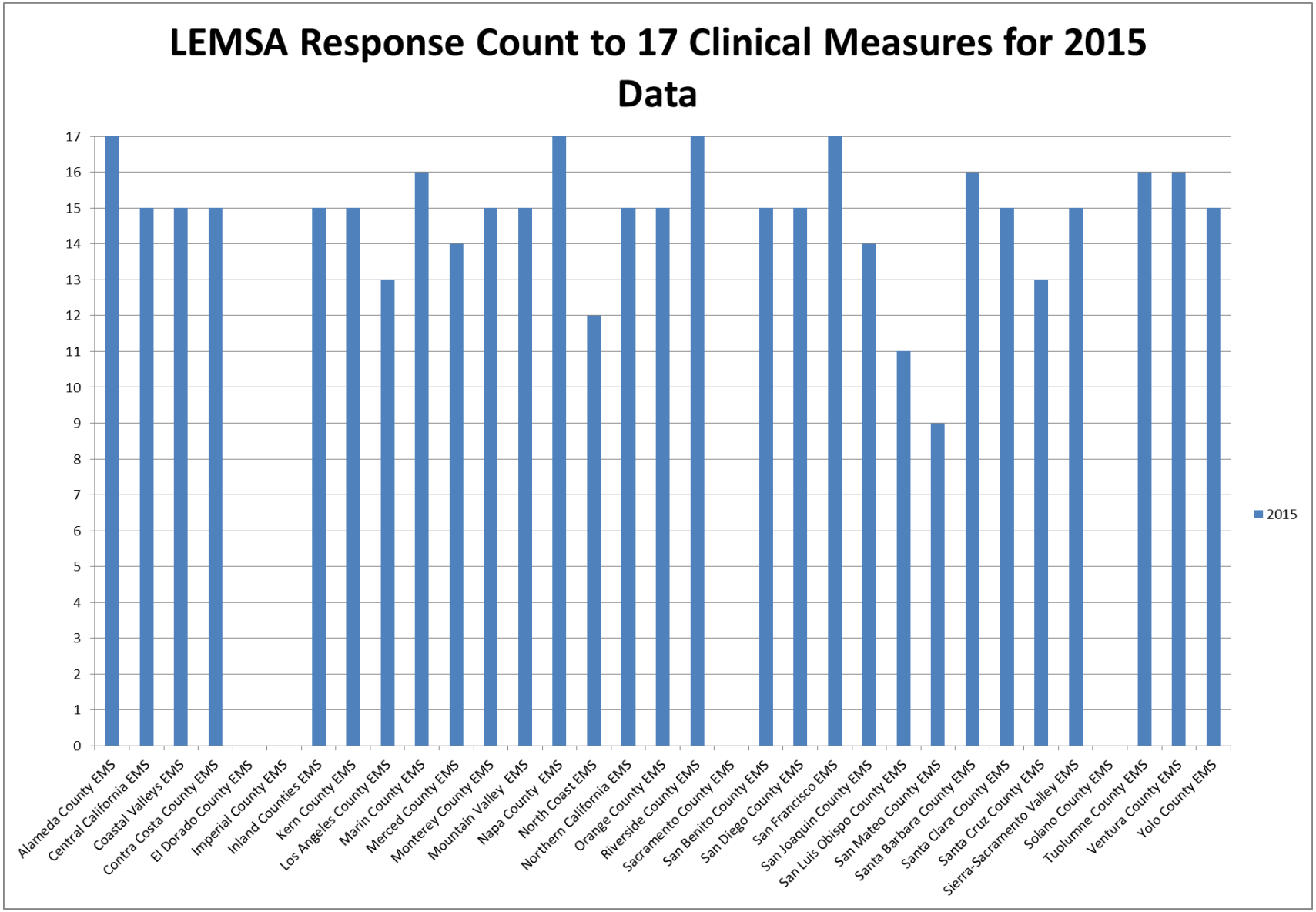

Note: This chart only displays the number of clinical measures each LEMSA was able to report and does not include the three (3) response and transport measures

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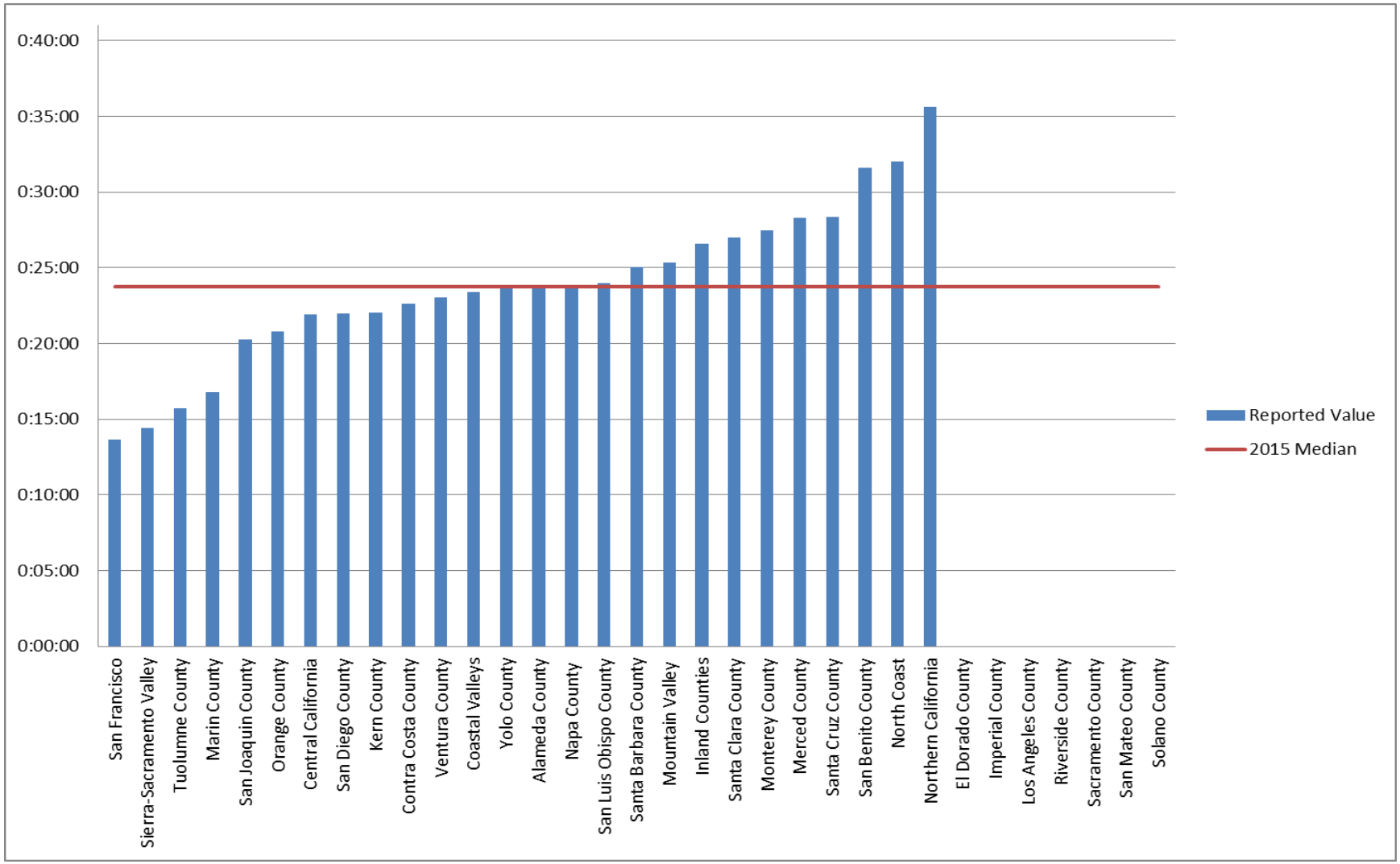
Clinical Measure Responses

TRA-1: Scene Time for Trauma Patients – Part 1 of 2



Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource disparities, and inability to collect hospital outcome data. This retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

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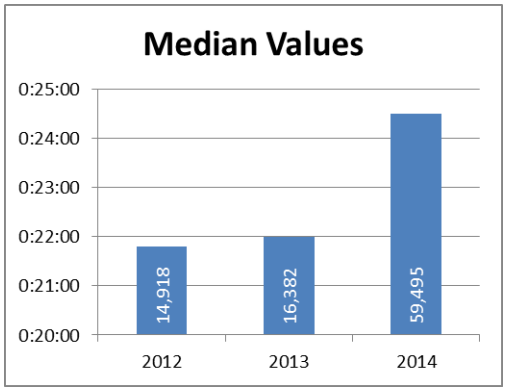
TRA-1: Scene Time for Trauma Patients – Part 2 of 2

	2015 Value	2015 Denom.
San Francisco	0:13:39	483
Sierra-Sacramento Valley	0:14:25	406
Tuolumne County	0:15:42	11
Marin County	0:16:46	29
San Joaquin County	0:20:16	649
Orange County	0:20:48	205
Central California	0:21:55	1281
San Diego County	0:22:00	4336
Kern County	0:22:02	244
Contra Costa County	0:22:39	112
Ventura County	0:23:02	284
Coastal Valleys	0:23:24	306
Yolo County	0:23:36	176
Alameda County	0:23:52	201
Napa County	0:23:52	137
San Luis Obispo County	0:24:00	73
Santa Barbara County	0:25:01	511
Mountain Valley	0:25:19	467
Inland Counties	0:26:36	1109
Santa Clara County	0:26:59	772
Monterey County	0:27:28	490
Merced County	0:28:17	340
Santa Cruz County	0:28:20	843
San Benito County	0:31:36	58
North Coast	0:32:00	435
Northern California	0:35:36	78
El Dorado County		
Imperial County		
Los Angeles County		
Riverside County		
Sacramento County		
San Mateo County		
Solano County		

Empty grey cells indicate no value reported

Measure ID	TRA-1
Response Count	27
Denominator Total	14036
Submission Rate (n=33)	81.82%
Average	0:23:49
Median	0:23:44



Of the 28 LEMSAs reporting these data for 2014, the median scene time was 24 minutes, 30 seconds. Adjustments were made for 2014 to the Trauma measures to analyze a larger population of trauma patients. Changes to the trauma measures include the removal of the revised trauma score to shift from examining those severely injured trauma patients, to all trauma patients meeting the CDC Trauma Triage Criteria. This likely accounts for the increase in median time.

The common expectation is for short scene times, targeted at 15 minutes, with rapid transport to remain within a "golden hour" for care in a hospital with surgical capability. Reported scene times may be influenced by extrication. Moreover, the Golden Hour concept and trauma response time have both been challenged in the literature.

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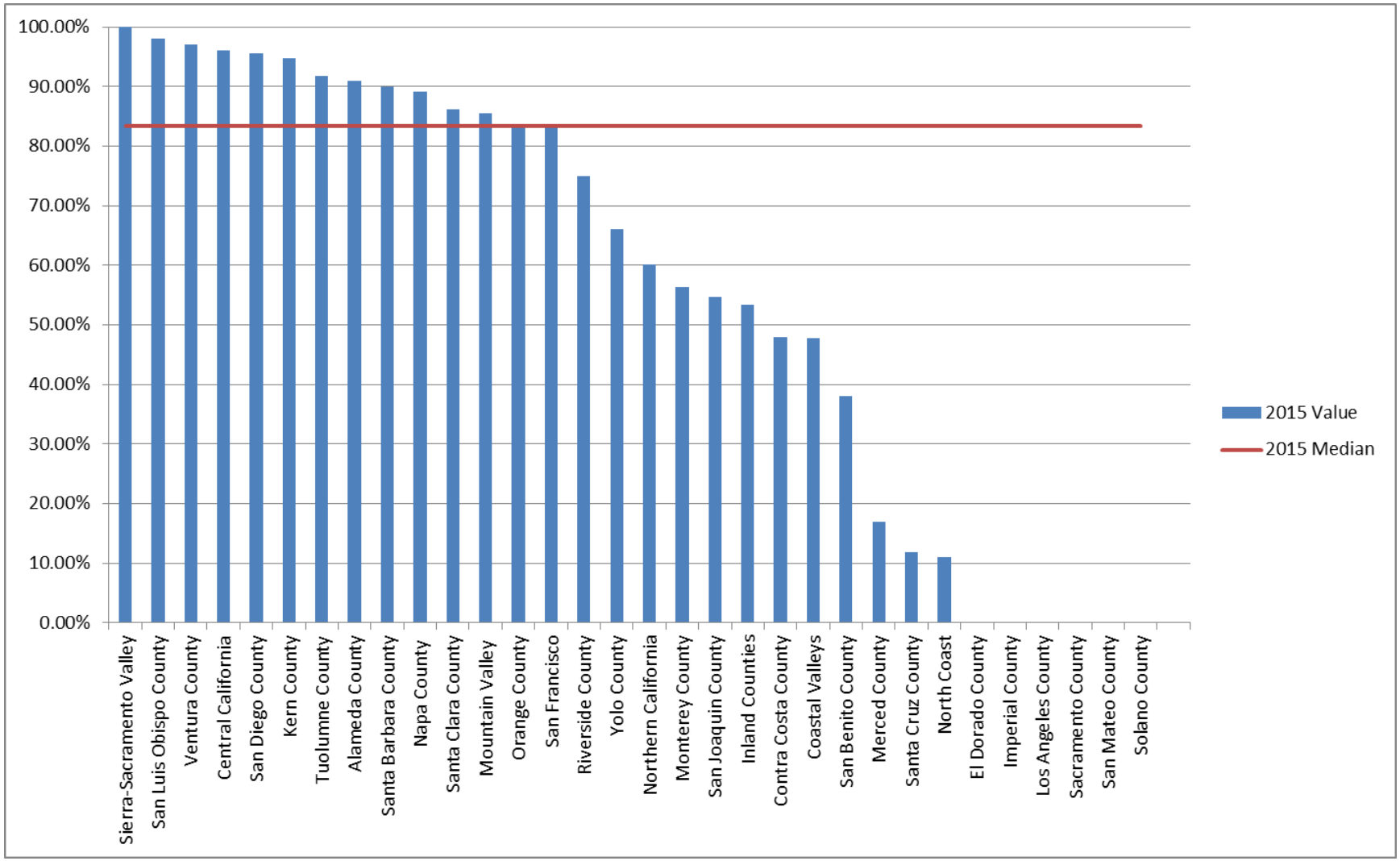
TRA-2: Direct Transport to Designated Trauma Center for Trauma Patients Meeting Criteria – Part 1 of 2



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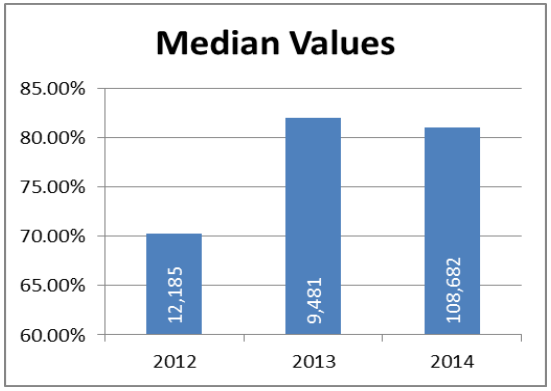
TRA-2: Direct Transport to Designated Trauma Center for Trauma Patients Meeting Criteria – Part 2 of 2

	2015 Value	2015 Denom.
Marin County	100.00%	29
Sierra-Sacramento Valley	98.03%	406
San Luis Obispo County	97.00%	73
Ventura County	96.00%	284
Central California	95.63%	1281
San Diego County	94.69%	8225
Kern County	91.80%	244
Tuolumne County	91.00%	11
Alameda County	90.00%	201
Santa Barbara County	89.20%	511
Napa County	86.16%	137
Santa Clara County	85.49%	772
Mountain Valley	83.73%	467
Orange County	83.00%	205
San Francisco	75.00%	483
Riverside County	66.12%	1966
Yolo County	60.20%	176
Northern California	56.41%	78
Monterey County	54.69%	490
San Joaquin County	53.31%	649
Inland Counties	48.00%	1109
Contra Costa County	47.80%	112
Coastal Valleys	38.00%	306
San Benito County	17.00%	58
Merced County	11.76%	340
Santa Cruz County	11.00%	843
North Coast		
El Dorado County		
Imperial County		
Los Angeles County		
Sacramento County		
San Mateo County		
Solano County		

Empty grey cells indicate no value reported

Measure ID	TRA-2
Response Count	26
Denominator Total	19456
Submission Rate (n=33)	78.79%
Average	70.04%
Median	83.37%



Of the 27 LEMSAs reporting these data for 2014, the median of patients transported directly to a trauma center was 81%. Adjustments were made to the Trauma measures to analyze a larger population of trauma patients. Changes to the measures from the prior years include the removal of the revised trauma score to shift from examining severely injured trauma patients to all trauma patients meeting the Center for Disease Control Trauma Triage Criteria.

Low values would be expected in some rural areas with prolonged transport times to a trauma center. The measure does not distinguish among level of trauma center.

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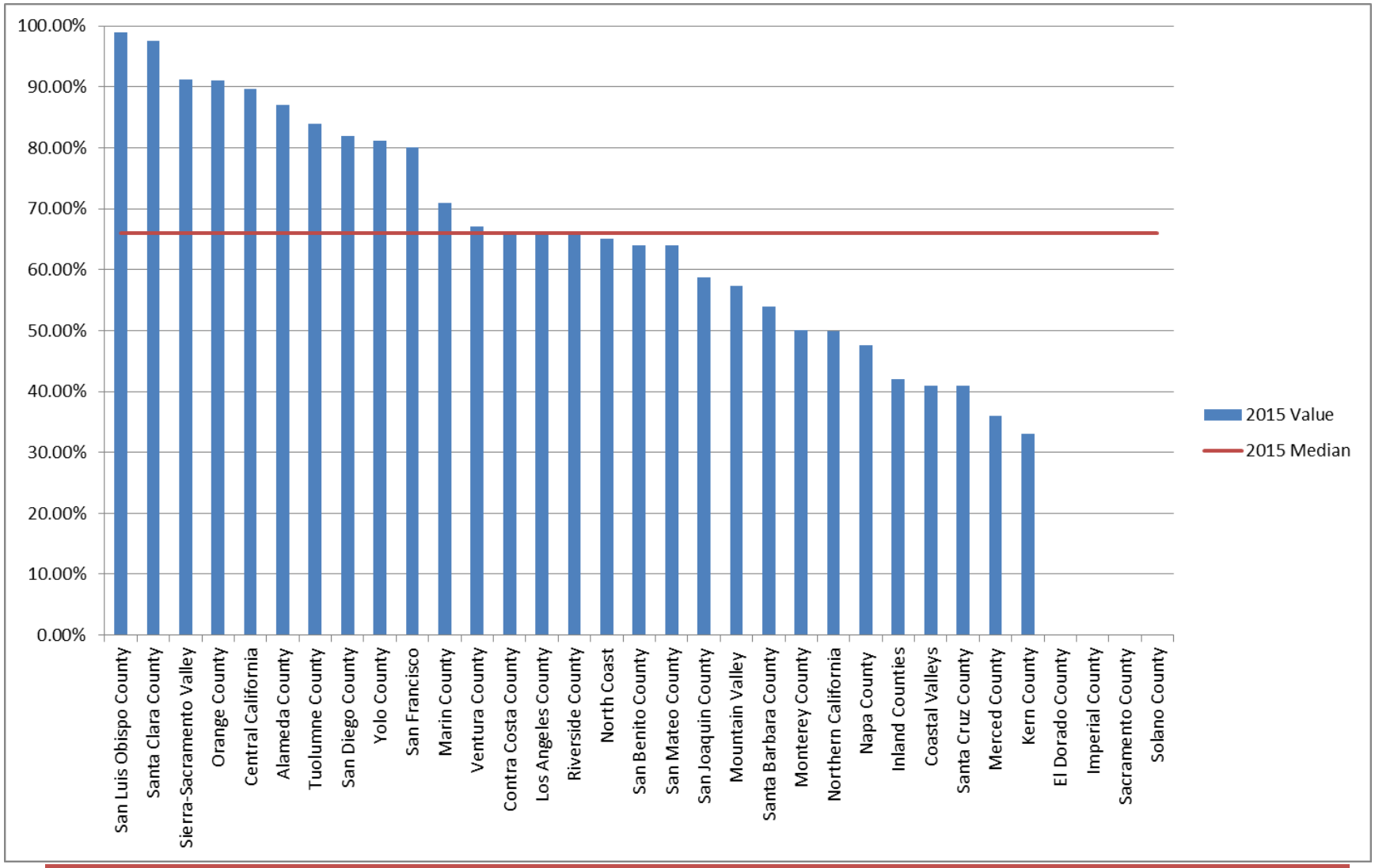
ACS-1: Aspirin Administration for Chest Pain/Discomfort Rate – Part 1 of 2



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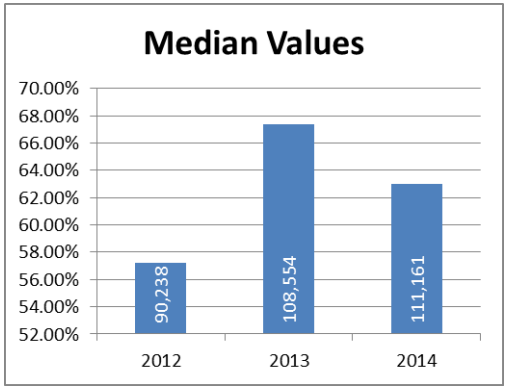
ACS-1: Aspirin Administration for Chest Pain/Discomfort Rate – Part 2 of 2

	2015 Value	2015 Denom.
San Luis Obispo County	99.00%	559
Santa Clara County	97.47%	2372
Sierra-Sacramento Valley	91.16%	4129
Orange County	91.00%	883
Central California	89.61%	5131
Alameda County	87.00%	3929
Tuolumne County	84.00%	286
San Diego County	81.85%	11156
Yolo County	81.10%	679
San Francisco	80.00%	1588
Marin County	71.00%	601
Ventura County	67.00%	2157
Contra Costa County	66.27%	3463
Los Angeles County	66.00%	18309
Riverside County	66.00%	9073
North Coast	65.00%	1116
San Benito County	64.00%	88
San Mateo County	64.00%	1393
San Joaquin County	58.72%	2505
Mountain Valley	57.40%	1993
Santa Barbara County	54.00%	1166
Monterey County	50.00%	964
Northern California	49.89%	437
Napa County	47.53%	751
Inland Counties	42.00%	13143
Coastal Valleys	41.00%	1564
Santa Cruz County	41.00%	863
Merced County	36.00%	2467
Kern County	33.00%	5509
El Dorado County		
Imperial County		
Sacramento County		
Solano County		

Empty grey cells indicate no value reported

Measure ID	ACS-1
Response Count	29
Denominator Total	98274
Submission Rate (n=33)	84.85%
Average	66.28%
Median	66.00%



Of the 31 LEMSAs reporting these data for 2014, the median percentage of patients receiving aspirin in the field for complaints of chest pain or discomfort suggestive of cardiac origin was 63%.

Factors for a low reported value include lack of documentation, or aspirin administered by the patient/family or first responder paramedics but not reflected in the patient care record by the ambulance transport service. Variation is also introduced by which chest pain patients are identified in the data search. The number of LEMSAs reporting this measure increased from 27 to 31, leading to an increase in number of records analyzed; however, the median value decreased from 67% to 63%. This is likely due to methodological refinements and new LEMSAs reporting. The wide variation should not be attributed to performance at this time, but should prompt evaluation of protocols and discussion with field providers.

Aspirin administration is the expected "standard of care" for chest pain and chest discomfort of cardiac origin. All 33 LEMSAs have aspirin administration in their protocol for management of suspected ACS patients.

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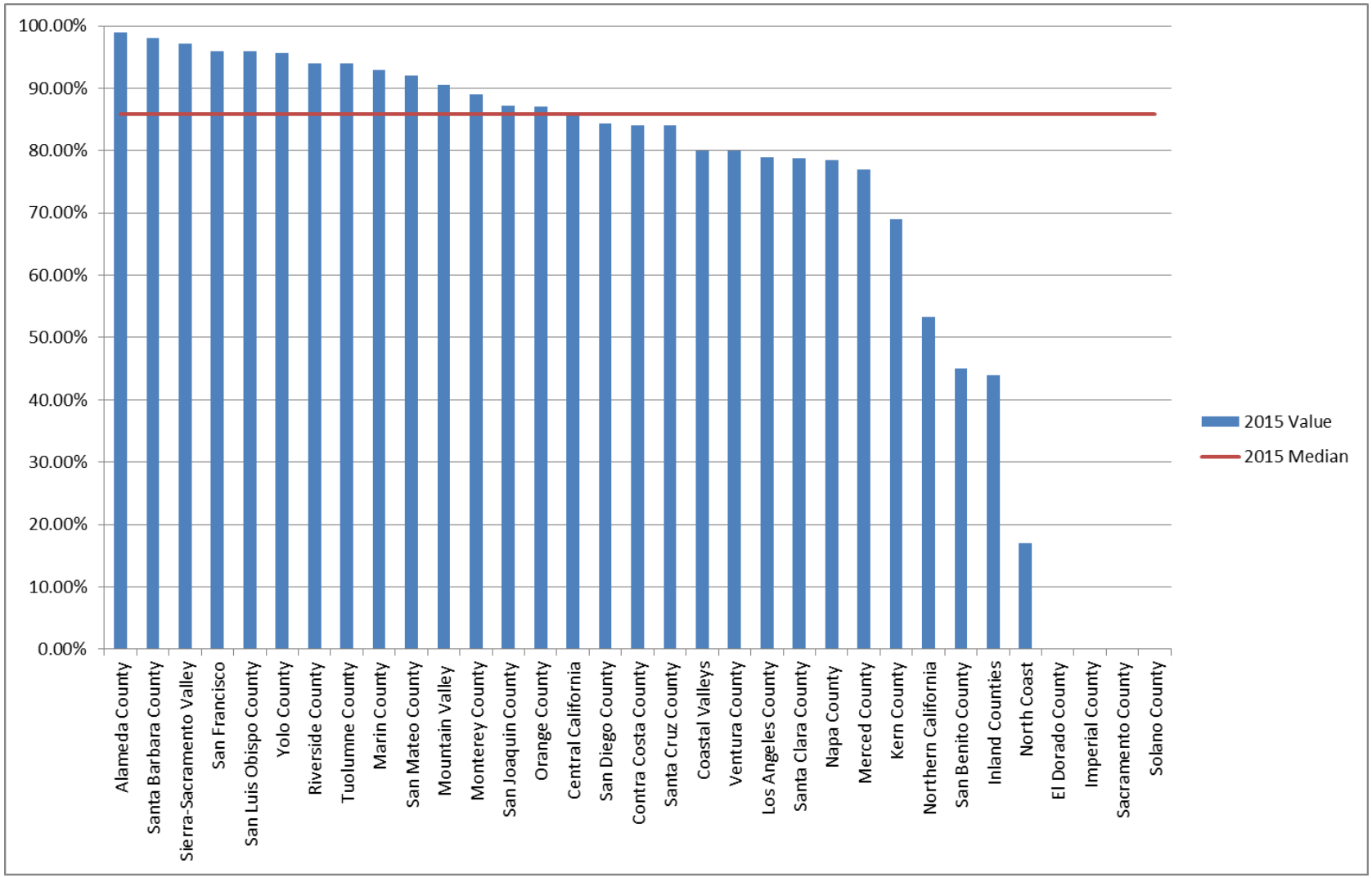
ACS-2: 12 Lead ECG Performance – Part 1 of 2



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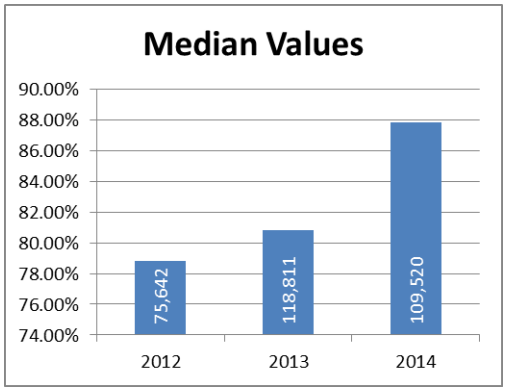
ACS-2: 12 Lead ECG Performance – Part 2 of 2

	2015 Value	2015 Denom.
Alameda County	99.00%	3895
Santa Barbara County	98.00%	88
Sierra-Sacramento Valley	97.17%	4129
San Francisco	96.00%	1588
San Luis Obispo County	96.00%	559
Yolo County	95.60%	679
Riverside County	94.00%	9073
Tuolumne County	94.00%	286
Marin County	93.00%	601
San Mateo County	92.00%	1393
Mountain Valley	90.47%	1993
Monterey County	89.00%	964
San Joaquin County	87.23%	2505
Orange County	87.00%	1868
Central California	85.81%	5131
San Diego County	84.39%	11156
Contra Costa County	84.08%	3859
Santa Cruz County	84.00%	863
Coastal Valleys	80.00%	1564
Ventura County	80.00%	2157
Los Angeles County	79.00%	18308
Santa Clara County	78.71%	5280
Napa County	78.42%	751
Merced County	77.00%	2467
Kern County	69.00%	5509
Northern California	53.32%	437
San Benito County	45.00%	88
Inland Counties	44.00%	13143
North Coast	17.00%	1116
El Dorado County		
Imperial County		
Sacramento County		
Solano County		

Empty grey cells indicate no value reported

Measure ID	ACS-2
Response Count	29
Denominator Total	101450
Submission Rate (n=33)	84.85%
Average	80.97%
Median	85.81%



Of the 31 LEMSAs reporting these data for 2014, the median number of patients receiving 12-Lead ECG in the field for complaints of chest pain or discomfort suggestive of cardiac origin was 87.9%.

There was a marked increase in number of records analyzed and additional LEMSAs reporting. The median has increased significantly over the past 3 years. Additionally, there was moderate consistency in this measure, with most LEMSAs reporting 70-100% compliance. Low values more likely represent data and methodological issues rather than actual performance. This measure is of particular importance with the widespread development of STEMI centers. LEMSAs with a STEMI system in place are more likely to use 12 lead for identifying STEMI patients, a nationally recommended procedure by the American Heart Association. The draft STEMI regulations define "STEMI Patient" as one with characteristic symptoms of myocardial ischemia in association with persistent ST-Segment Elevation in ECG and that "The STEMI system policies shall address … identification of STEMI patients through the use of pre-hospital 12-lead ECG…" The American Heart Association has stated that the national goal is for an "in the field ECG." Thirty-one of 33 LEMSAs have developed STEMI systems and currently include field ECG in their management protocol.

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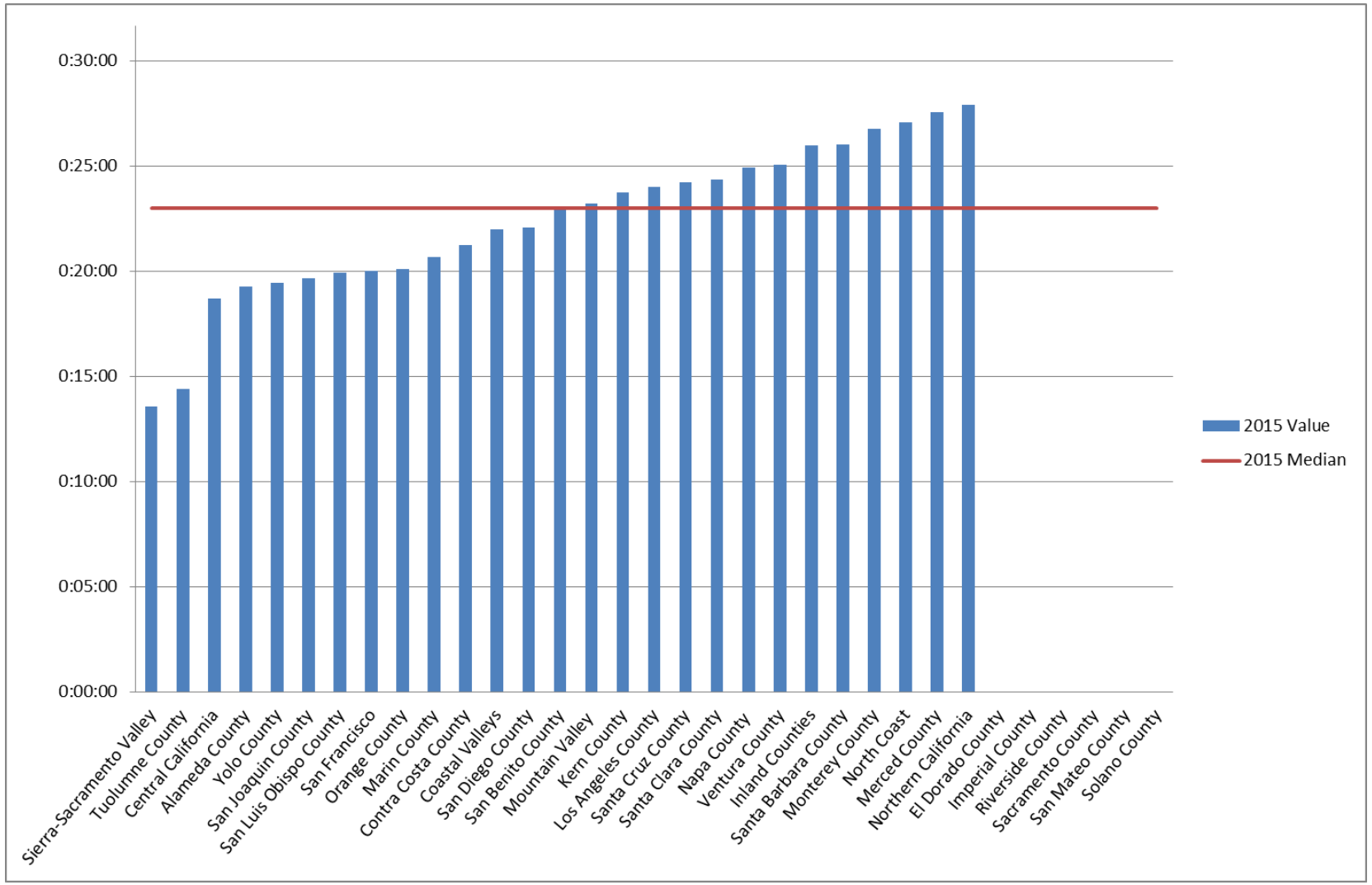
ACS-3: Scene Time for Suspected Heart Attack Patients – Part 1 of 2



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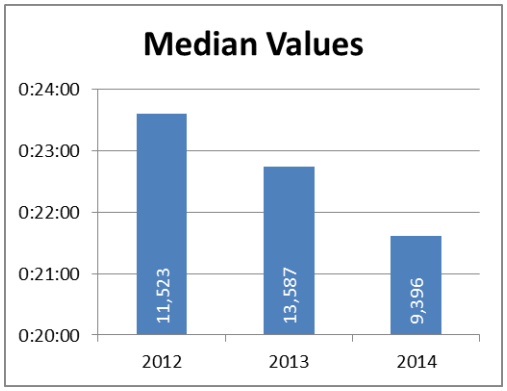
ACS-3: Scene Time for Suspected Heart Attack Patients – Part 2 of 2

	2015 Value	2015 Denom.
Sierra-Sacramento Valley	0:13:35	304
Tuolumne County	0:14:25	20
Central California	0:18:42	170
Alameda County	0:19:15	568
Yolo County	0:19:27	679
San Joaquin County	0:19:40	353
San Luis Obispo County	0:19:55	89
San Francisco	0:20:00	661
Orange County	0:20:06	112
Marin County	0:20:40	73
Contra Costa County	0:21:16	3859
Coastal Valleys	0:22:00	107
San Diego County	0:22:06	4140
San Benito County	0:23:00	88
Mountain Valley	0:23:14	1838
Kern County	0:23:44	46
Los Angeles County	0:24:00	1102
Santa Cruz County	0:24:15	45
Santa Clara County	0:24:21	431
Napa County	0:24:57	63
Ventura County	0:25:03	206
Inland Counties	0:26:00	710
Santa Barbara County	0:26:01	88
Monterey County	0:26:46	226
North Coast	0:27:06	90
Merced County	0:27:34	2467
Northern California	0:27:54	18
El Dorado County		
Imperial County		
Riverside County		
Sacramento County		
San Mateo County		
Solano County		

Empty grey cells indicate no value reported

Measure ID	ACS-3
Response Count	27
Denominator Total	18553
Submission Rate (n=33)	81.82%
Average	0:22:27
Median	0:23:07



Of the 29 LEMSAs reporting these data for 2014, the median scene time by ground ambulance for suspected heart attack patients with ST elevation on ECG was approximately 21 minutes and 37 seconds, decreased about 10% from prior year of reporting. Over the past 3 years, there has been a progressive decrease in the mean. There is limited variation with most agencies between 20-25 minutes.

Typically LEMSA protocols encourage paramedics to transport STEMI patients from the scene in 15 minutes or less since there is a time dependent goal to take the patient to the hospital catheterization suite to open blocked vessels. Further examination of this measure is warranted, including methodology, documentation, and validation. According to the American Heart Association, the national goal is for a scene time of 15 minutes, although given the evaluation and interventions needed for these patients, 15 minutes may be unrealistic.
http://www.heart.org/HEARTORG/HealthcareResearch/MissionLifelineHomePage/EMS/EMS-Strategies-to-Achieve-Ideal_UCM_312066_Article.jsp

An (*) denotes the 24 LEMSAs with a STEMI Receiving Center

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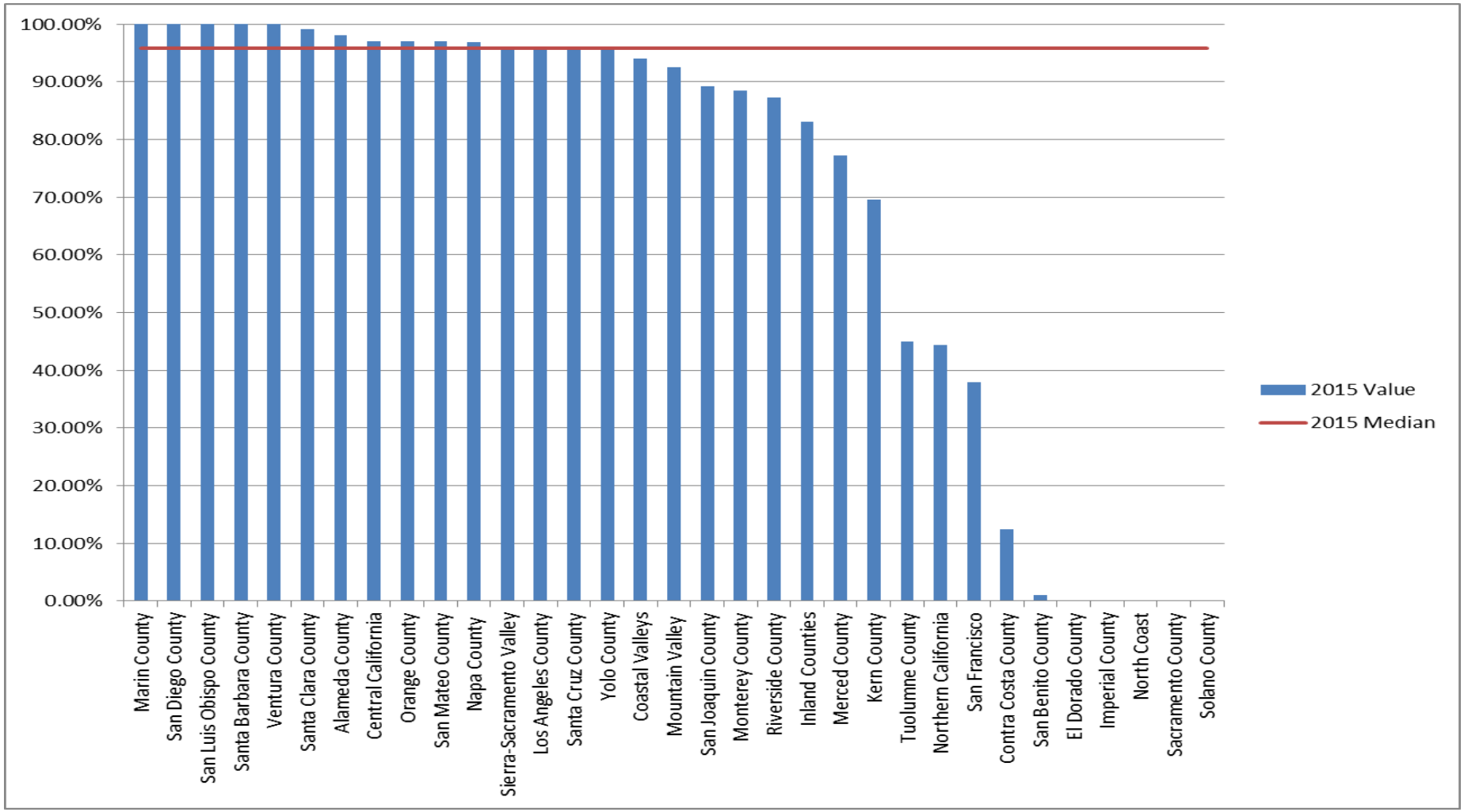
ACS-5: Direct Transport to Designated STEMI Receiving Center for Suspected Patients Meeting Criteria – Part 1 of 2



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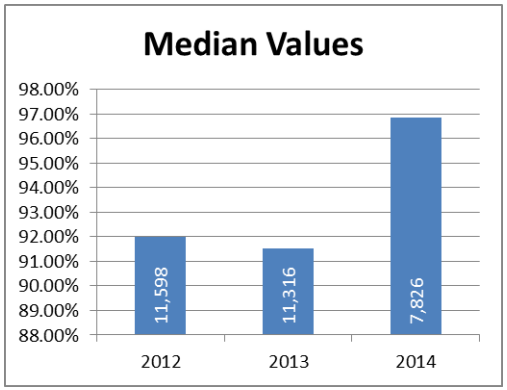
ACS-5: Direct Transport to Designated STEMI Receiving Center for Suspected Patients Meeting Criteria – Part 2 of 2

	2015 Value	2015 Denom.
Marin County	100.00%	73
San Diego County	100.00%	602
San Luis Obispo County	100.00%	89
Santa Barbara County	100.00%	88
Ventura County	100%	206
Santa Clara County	99.07%	431
Alameda County	98.00%	568
Central California	97.06%	170
Orange County	97.00%	107
San Mateo County	97.00%	211
Napa County	96.92%	65
Sierra-Sacramento Valley	96.05%	304
Los Angeles County	96.00%	1102
Santa Cruz County	96.00%	45
Yolo County	95.70%	70
Coastal Valleys	94.00%	139
Mountain Valley	92.50%	200
San Joaquin County	89.24%	353
Monterey County	88.50%	226
Riverside County	87.32%	1178
Inland Counties	83.00%	710
Merced County	77.22%	2467
Kern County	69.57%	46
Tuolumne County	45.00%	20
Northern California	44.44%	18
San Francisco	38.00%	661
Contra Costa County	12.50%	3455
San Benito County	1.01%	99
El Dorado County		
Imperial County		
North Coast		
Sacramento County		
Solano County		

Empty grey cells indicate no value reported

Measure ID	ACS-5
Response Count	28
Denominator Total	13703
Submission Rate (n=33)	81.82%
Average	81.83%
Median	95.85%



Of the 28 LEMSAs reporting these data, the median percentage of patients appropriately transported directly to a STEMI center was 96.9%, a significant increase from the prior year reporting.

Direct transport of patients to a STEMI centers with percutaneous coronary intervention (PCI) capability will vary by geography and availability of resources in a given area. Generally, LEMSAs with a higher level of direct transport are often urban areas with a STEMI system in their geographic area. Lower values would be expected in a rural area that may not have an established STEMI system or one that can be accessed rapidly in a neighboring LEMSA.

Several LEMSAs with measures below 90% may have STEMI systems, implying poor data quality or potential protocol violations.

24 of 33 LEMSAs have STEMI Receiving Center.

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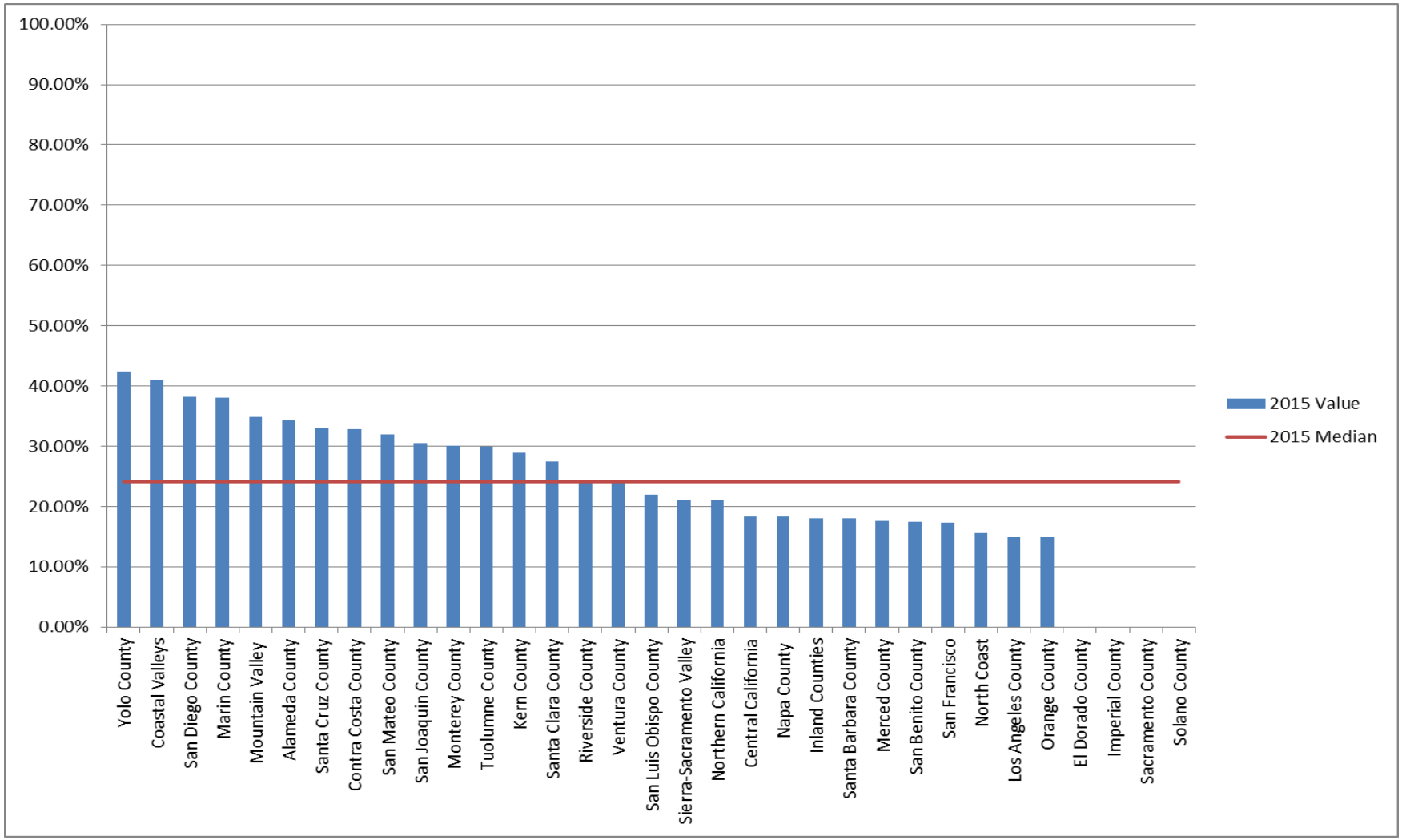
CAR-2: Out-Of-Hospital Cardiac Arrest Return of Spontaneous Circulation – Part 1 of 2



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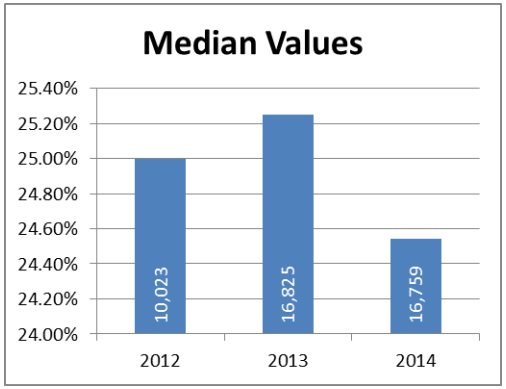
CAR-2: Out-Of-Hospital Cardiac Arrest Return of Spontaneous Circulation – Part 2 of 2

	2015 Value	2015 Denom.
Yolo County	42.40%	92
Coastal Valleys	41.00%	133
San Diego County	38.26%	677
Marin County	38.00%	74
Mountain Valley	34.84%	376
Alameda County	34.27%	1109
Santa Cruz County	33.00%	70
Contra Costa County	32.88%	672
San Mateo County	32.00%	228
San Joaquin County	30.58%	497
Monterey County	30.10%	196
Tuolumne County	30.00%	27
Kern County	28.85%	52
Santa Clara County	27.49%	902
Riverside County	24.06%	2315
Ventura County	23.90%	419
San Luis Obispo County	22.00%	203
Sierra-Sacramento Valley	21.13%	265
Northern California	21.05%	95
Central California	18.30%	918
Napa County	18.30%	71
Inland Counties	18.00%	1501
Santa Barbara County	18.00%	235
Merced County	17.59%	290
San Benito County	17.39%	23
San Francisco	17.37%	426
North Coast	15.70%	153
Los Angeles County	15.00%	4142
Orange County	15.00%	416
El Dorado County		
Imperial County		
Sacramento County		
Solano County		

Empty grey cells indicate no value reported

Measure ID	CAR-2
Response Count	29
Denominator Total	16577
Submission Rate (n=33)	84.85%
Average	26.08%
Median	24.06%



Of the 30 LEMSAs reporting these data for 2014, the median number of patients that had a return of spontaneous circulation in the field after a cardiac arrest from all causes was 24.5%, a decrease from the prior year reporting.

Nationally, this rate varies considerably by state and by local agency. Most jurisdictions reported rates from 10-40%, which is credible. In addition to methodological challenges (evidenced by one LEMSA reporting 100%), this outcome measure is dependent upon factors that vary considerably by community, including rapid public response, bystander CPR, community automated external defibrillation use, response times by first responders and ALS providers, and presenting cardiac rhythm. At this time, these results should not be considered accurate measures of performance. Values vary widely, depending on multiple factors. National rate for return to spontaneous circulation is 40%. Values for a particular system should be used to track improvements.

An (*) on the table to the left designates Cardiac Arrest Registry to Enhance Survival (CARES) participants; the values are probably most reliable for these participants.

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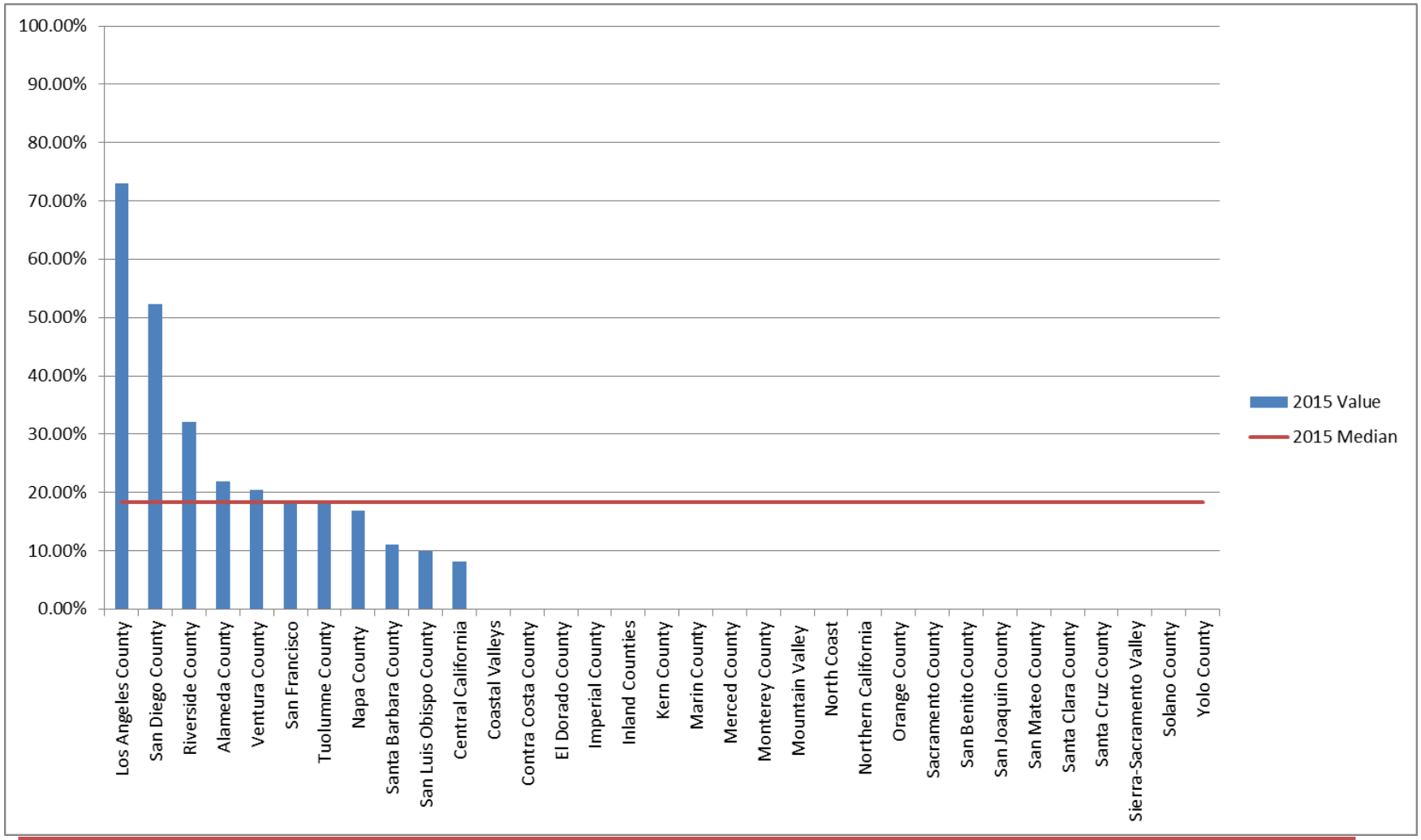
CAR-3: Out-Of-Hospital Cardiac Arrest Survival to Emergency Department Discharge – Part 1 of 2



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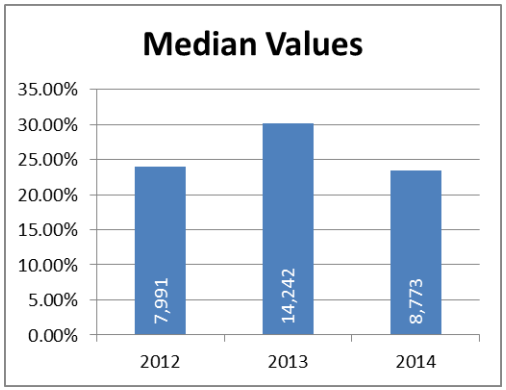
CAR-3: Out-Of-Hospital Cardiac Arrest Survival to Emergency Department Discharge – Part 2 of 2

	2015 Value	2015 Denom.
Los Angeles County	73.00%	2738
San Diego County	52.31%	325
Riverside County	32.07%	661
Alameda County	21.90%	927
Ventura County	21%	419
San Francisco	18.31%	426
Tuolumne County	18.00%	27
Napa County	16.90%	71
Santa Barbara County	11.00%	235
San Luis Obispo County	10.00%	203
Central California	8.17%	918
Coastal Valleys		
Contra Costa County		
El Dorado County		
Imperial County		
Inland Counties		
Kern County		
Marin County		
Merced County		290
Monterey County		
Mountain Valley		
North Coast		
Northern California		95
Orange County		415
Sacramento County		
San Benito County		
San Joaquin County		
San Mateo County		
Santa Clara County		
Santa Cruz County		
Sierra-Sacramento Valley		
Solano County		
Yolo County		

Empty grey cells indicate no value reported

Measure ID	CAR-3
Response Count	11
Denominator Total	7750
Submission Rate (n=33)	33.33%
Average	25.65%
Median	18.31%



Of the 12 LEMSAs reporting these data for 2014, the median number of patients that had survived a return hospital cardiac arrest to be admitted to the hospital was 23.50%. This measure included an increase of one LEMSA response from the prior year of reporting. Obtaining hospital outcome data continues to be a challenge faced by many LEMSAs. Accurate measure of this outcome is an important future quality improvement goal and supports the need to develop exchange of health information with hospitals. Marked variation is expected, but generally, this number is significantly less than the ROSC in the prior measure. Values vary widely, depending on multiple factors. Values for a particular system should be used to track improvements.

An (*) on the table to the left designates Cardiac Arrest Registry to Enhance Survival (CARES) participants; the values are probably most reliable for these participants.

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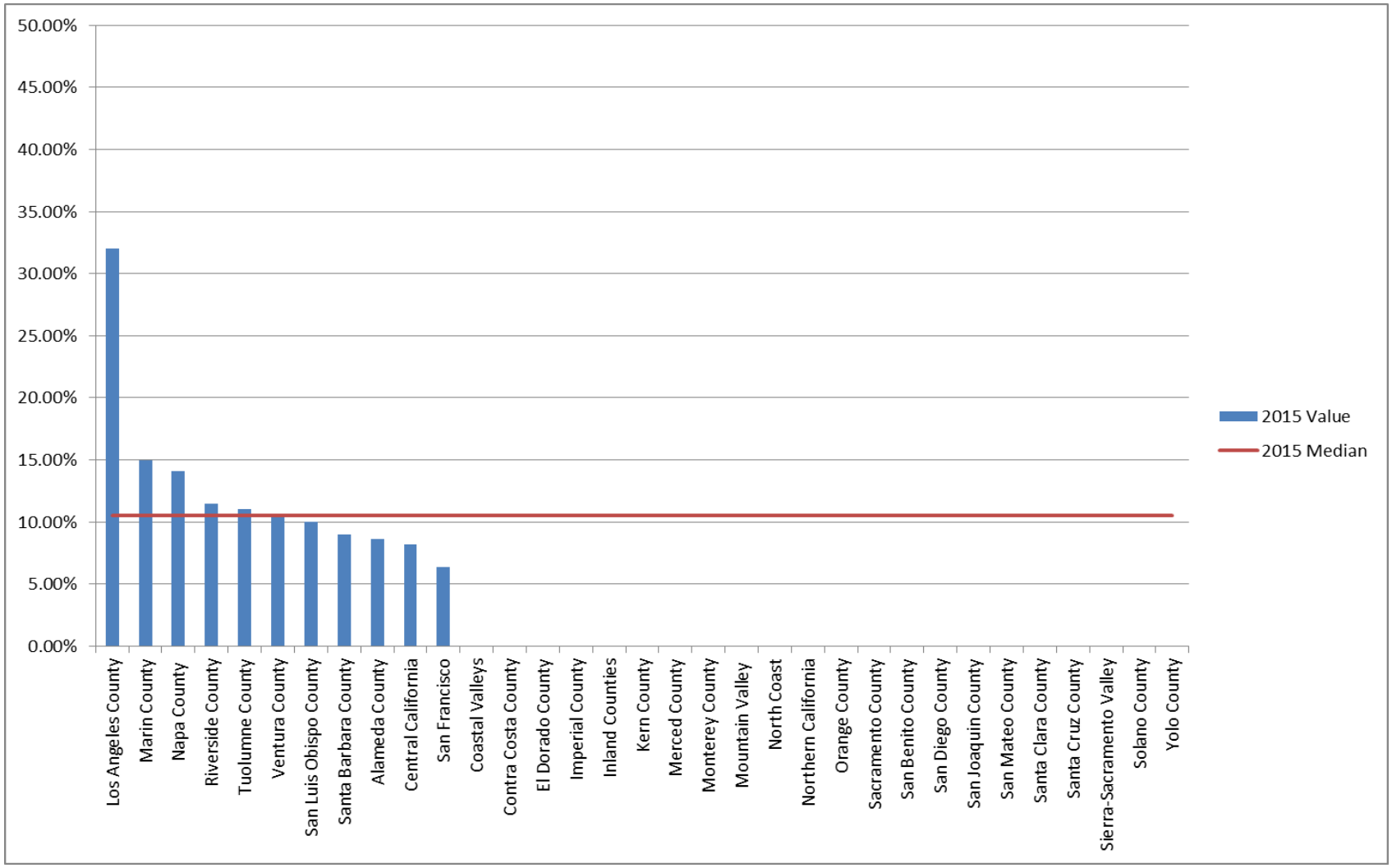
CAR-4: Out-Of-Hospital Cardiac Arrest Survival to Hospital Discharge – Part 1 of 2



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CAR-4: Out-Of-Hospital Cardiac Arrest Survival to Hospital Discharge – Part 2 of 2

	2015 Value	2015 Denom.
Los Angeles County	32.00%	2056
Marin County	15.00%	85
Napa County	14.08%	71
Riverside County	11.50%	661
Tuolumne County	11.00%	27
Ventura County	10.50%	419
San Luis Obispo County	10.00%	203
Santa Barbara County	9.00%	235
Alameda County	8.63%	927
Central California	8.17%	918
San Francisco	6.34%	426
Coastal Valleys		
Contra Costa County		
El Dorado County		
Imperial County		
Inland Counties		
Kern County		
Merced County		290
Monterey County		
Mountain Valley		
North Coast		
Northern California		95
Orange County		415
Sacramento County		
San Benito County		
San Diego County		
San Joaquin County		
San Mateo County		
Santa Clara County		
Santa Cruz County		
Sierra-Sacramento Valley		
Solano County		
Yolo County		

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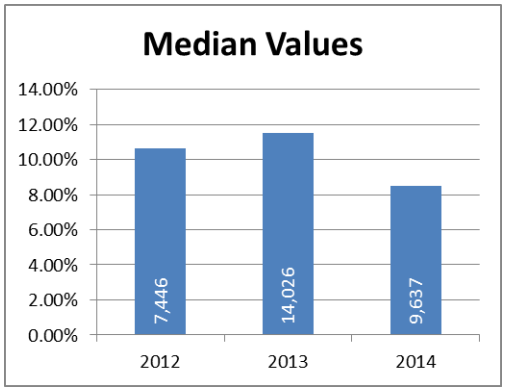
Measure ID	CAR-4
Response Count	11
Denominator Total	6828
Submission Rate (n=33)	33.33%
Average	12.38%
Median	10.50%



Of the 12 LEMSAs reporting these data for 2014, the median percentage of patients that had survived an out of hospital cardiac arrest and were discharged from the hospital was 8.5%. This measure yielded the lowest number of responses from LEMSAs because of the difficulties in obtaining hospital outcome data. Accurate measure of this outcome is an important future quality improvement goal and supports the need to develop exchange of health information with hospitals. An important refinement to this measure is the functional status on discharge. Values vary widely, depending on multiple factors. National rate for return to spontaneous circulation is 40% and survival to hospital discharge is 10%. Values for a particular system should be used to track improvements.

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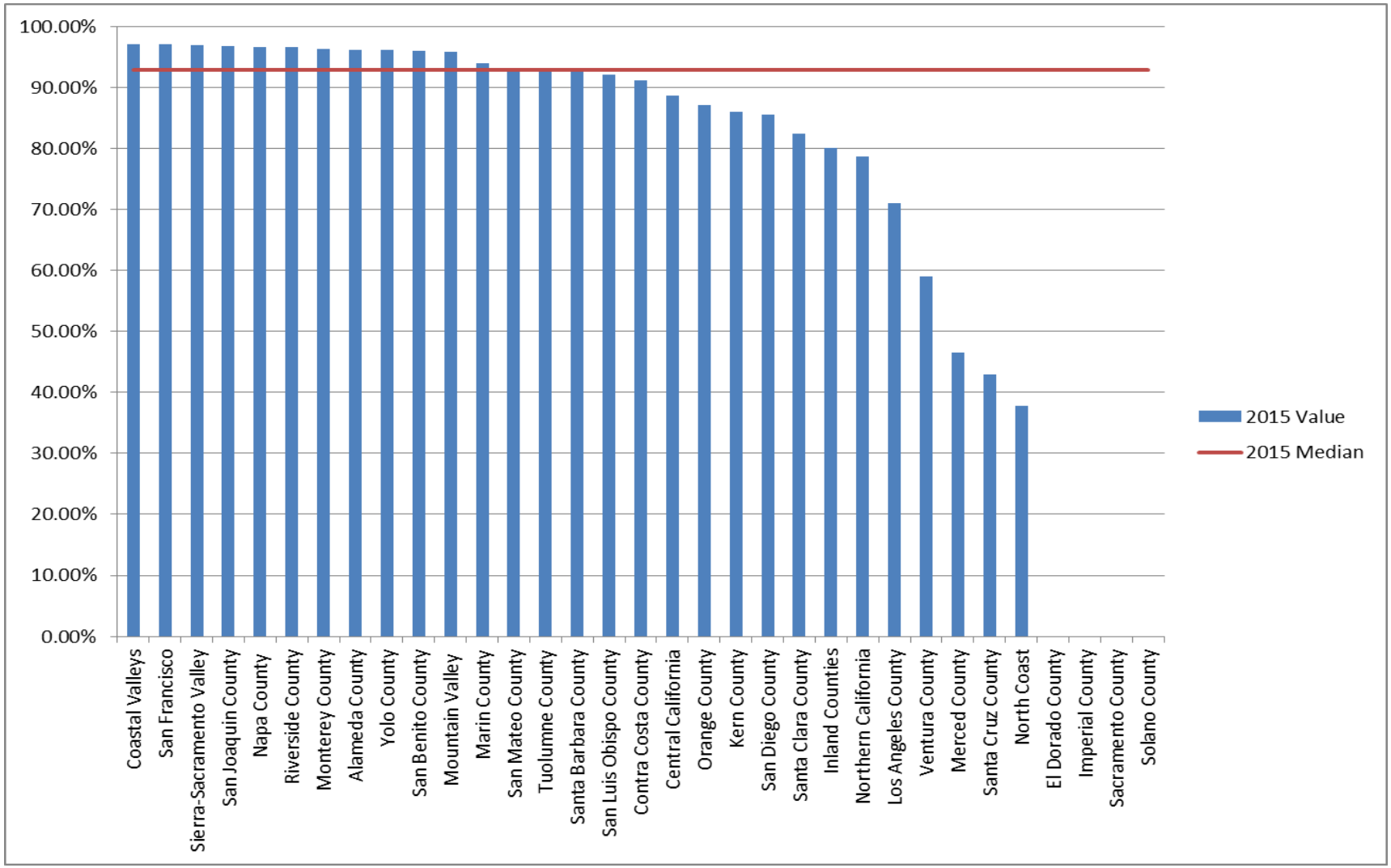
STR-2: Glucose Testing for Suspected Acute Stroke Patients – Part 1 of 2



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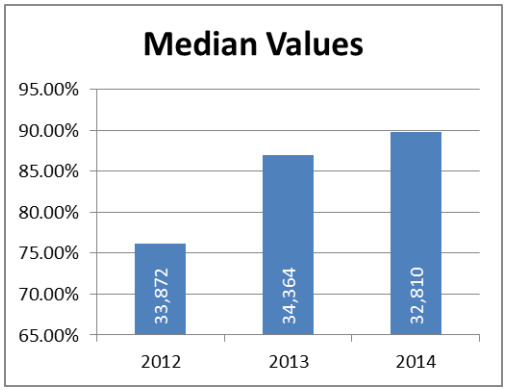
STR-2: Glucose Testing for Suspected Acute Stroke Patients – Part 2 of 2

	2015 Value	2015 Denom.
Coastal Valleys	97.00%	424
San Francisco	97.00%	764
Sierra-Sacramento Valley	96.96%	1120
San Joaquin County	96.70%	757
Napa County	96.59%	176
Riverside County	96.53%	2217
Monterey County	96.22%	502
Alameda County	96.16%	2055
Yolo County	96.10%	259
San Benito County	96.00%	25
Mountain Valley	95.84%	625
Marin County	94.00%	238
San Mateo County	93.00%	611
Tuolumne County	93.00%	114
Santa Barbara County	92.90%	351
San Luis Obispo County	92.00%	154
Contra Costa County	91.16%	1475
Central California	88.61%	1396
Orange County	87.00%	692
Kern County	85.91%	1143
San Diego County	85.47%	4115
Santa Clara County	82.34%	2021
Inland Counties	80.00%	2145
Northern California	78.70%	108
Los Angeles County	71.00%	5370
Ventura County	59.00%	464
Merced County	46.47%	411
Santa Cruz County	43.00%	300
North Coast	37.80%	222
El Dorado County		
Imperial County		
Sacramento County		
Solano County		

Empty grey cells indicate no value reported

Measure ID	STR-2
Response Count	29
Denominator Total	30254
Submission Rate (n=33)	84.85%
Average	84.91%
Median	92.90%



Of the 31 LEMSAs reporting these data for 2014, the median percentage of patients receiving glucose testing in the field for a possible stroke was 89%. This has increased steadily over the three years of reporting. Inconsistent low values likely reflect data issues but should be evaluated for adherence to protocol. Diabetic causes of neurologic symptoms are important to exclude prior to transporting to a stroke center and are part of stroke protocols. 32/33 LEMSAs have protocols that advise routine evaluation of blood sugar in suspected stroke patients.

An (*) indicates 22 LEMSAs that have developed a stroke system with a designated primary stroke receiving center. There are currently draft stroke regulations being finalized. In future reports, EMSA will be able to clearly identify the stroke systems statewide.

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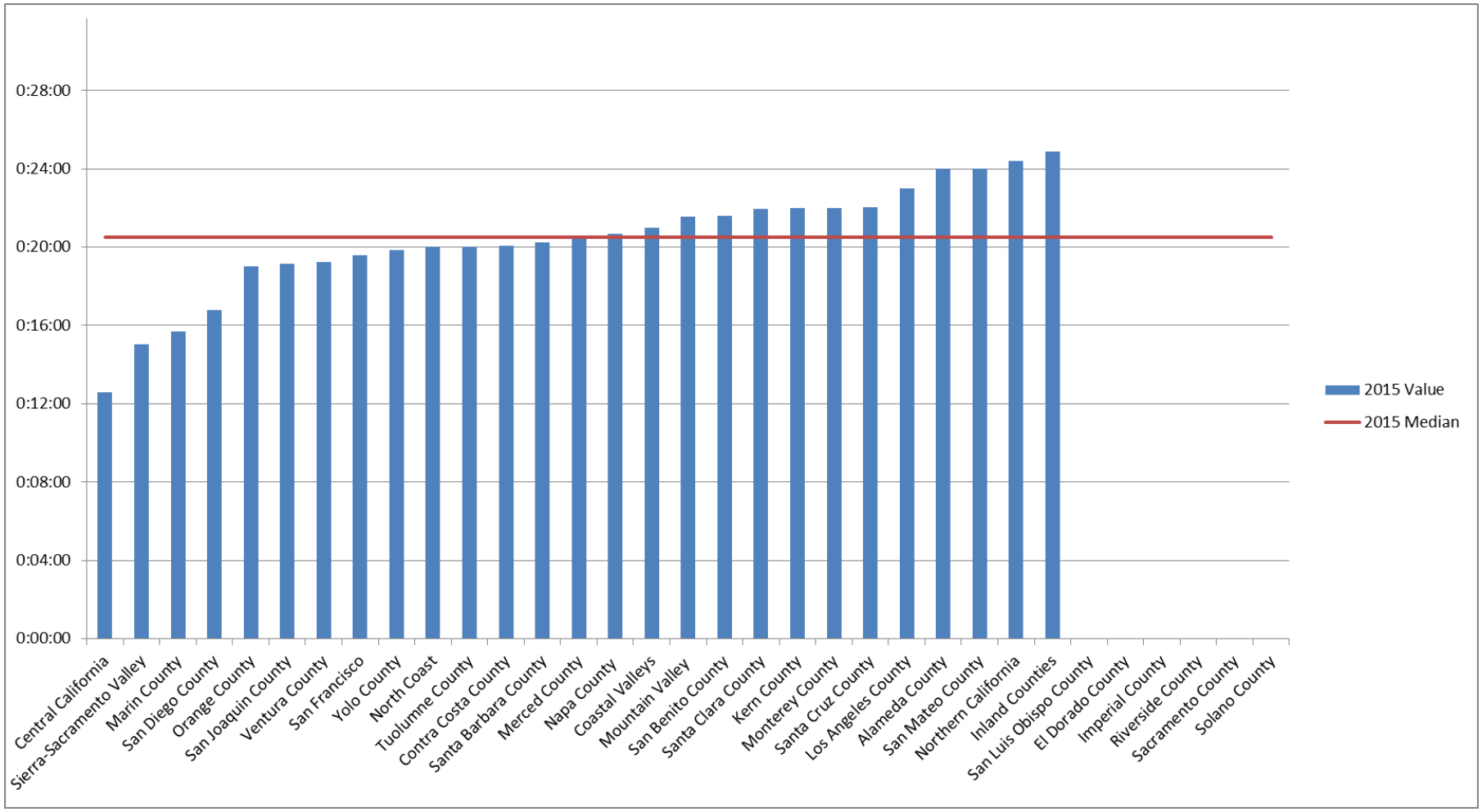
STR-3: Scene Time for Suspected Acute Stroke Patients – Part 1 of 2



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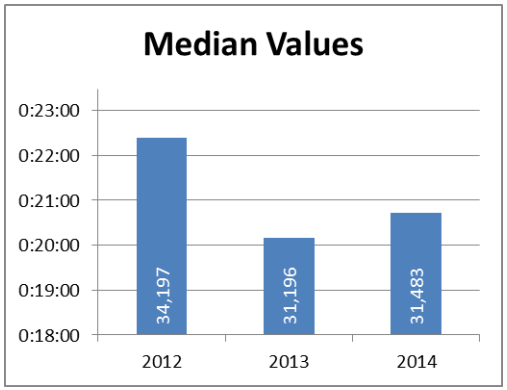
STR-3: Scene Time for Suspected Acute Stroke Patients – Part 2 of 2

	2015 Value	2015 Denom.
Central California	0:12:34	1396
Sierra-Sacramento Valley	0:15:03	1120
Marin County	0:15:42	128
San Diego County	0:16:48	2627
Orange County	0:19:00	692
San Joaquin County	0:19:10	757
Ventura County	0:19:13	425
San Francisco	0:19:36	764
Yolo County	0:19:51	259
North Coast	0:20:00	243
Tuolumne County	0:20:00	114
Contra Costa County	0:20:03	1475
Santa Barbara County	0:20:14	351
Merced County	0:20:29	411
Napa County	0:20:41	169
Coastal Valleys	0:20:58	420
Mountain Valley	0:21:32	620
San Benito County	0:21:36	24
Santa Clara County	0:21:58	1561
Kern County	0:22:00	1143
Monterey County	0:22:00	486
Santa Cruz County	0:22:02	
Los Angeles County	0:23:00	5537
Alameda County	0:23:59	2055
San Mateo County	0:24:00	608
Northern California	0:24:24	97
Inland Counties	0:24:52	1673
San Luis Obispo County		
El Dorado County		
Imperial County		
Riverside County		
Sacramento County		
Solano County		

Empty grey cells indicate no value reported

Measure ID	STR-3
Response Count	26
Denominator Total	25155
Submission Rate (n=33)	75.76%
Average	0:20:24
Median	0:20:29



Of the 30 LEMSAs reporting these data for 2014, the median scene time by an ambulance for suspected stroke patients was approximately 20 minutes and 43 seconds, not significantly different from last year.

Times from all local jurisdictions reporting ranged between 15 and 28 minutes. 19/33 (58%) of LEMSAs have protocols that direct EMS to limit time on scene. Time targets may not be realistic for many patients who require more time for history, examination, and extraction from their residence. Stroke evaluation and treatment is a time sensitive measure, so extra minutes in the field add up with additional delays within the healthcare system. Further examination of this measure is warranted, including methodology, documentation, and validation.

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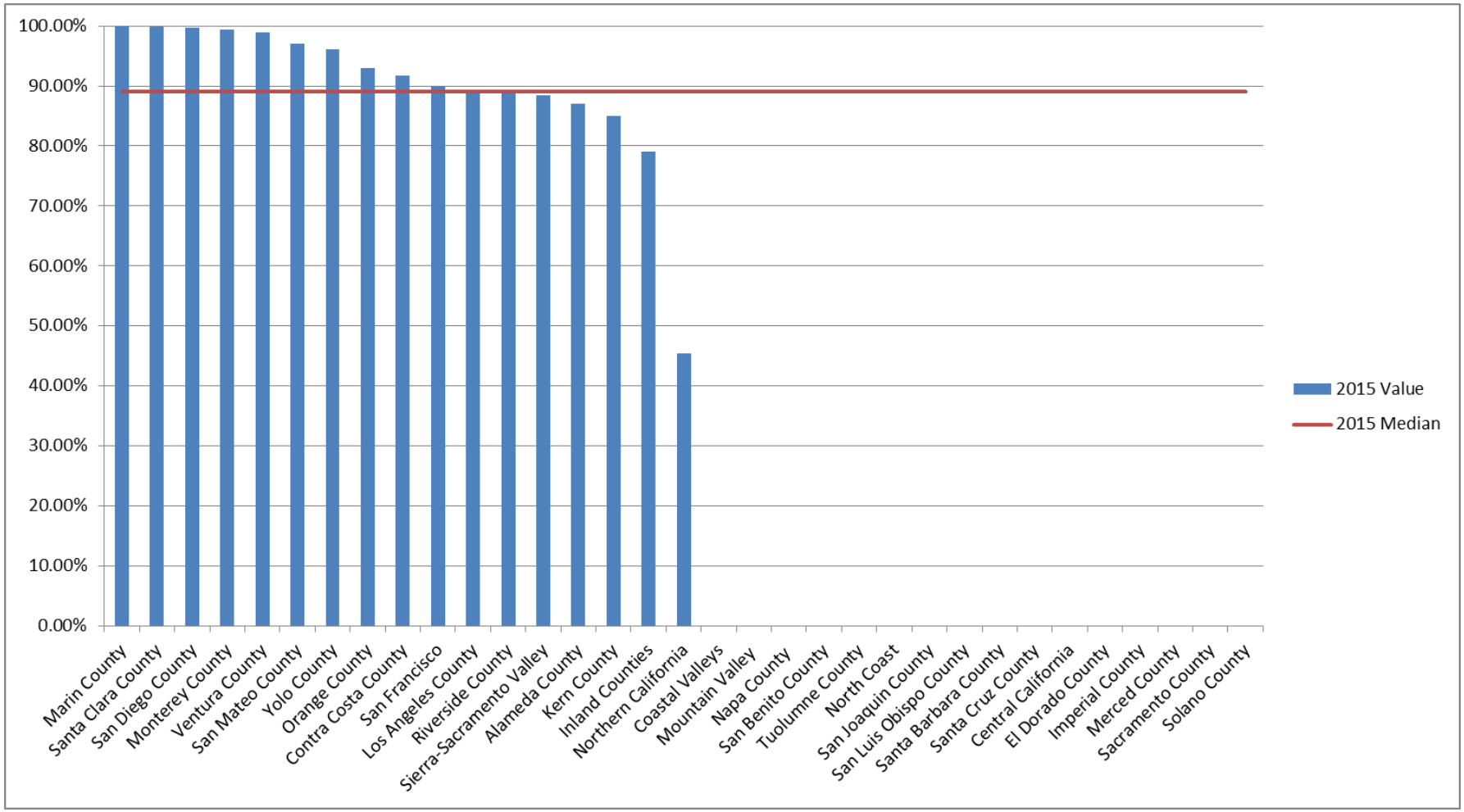
STR-5: Direct Transport to Stroke Center for Suspected Acute Stroke Patients Meeting Criteria – Part 1 of 2



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STR-5: Direct Transport to Stroke Center for Suspected Acute Stroke Patients Meeting Criteria – Part 2 of 2

	2015 Value	2015 Denom.
Marin County	100.00%	238
Santa Clara County	99.81%	1561
San Diego County	99.68%	4022
Monterey County	99.38%	846
Ventura County	99.00%	425
San Mateo County	97.00%	611
Yolo County	96.10%	259
Orange County	93.00%	692
Contra Costa County	91.80%	1271
San Francisco	90.00%	764
Los Angeles County	89.00%	5370
Riverside County	89.00%	2217
Sierra-Sacramento Valley	88.39%	1120
Alameda County	87.00%	2137
Kern County	85.00%	1143
Inland Counties	79.00%	1673
Northern California	45.36%	94
Coastal Valleys	0.00%	424
Mountain Valley	0.00%	626
Napa County	0.00%	169
San Benito County	0.00%	25
Tuolumne County	0.00%	114
North Coast		
San Joaquin County		
San Luis Obispo County		
Santa Barbara County		
Santa Cruz County		
Central California		
El Dorado County		
Imperial County		
Merced County		411
Sacramento County		
Solano County		

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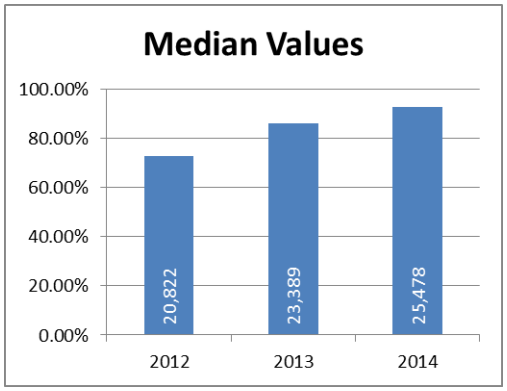
Measure ID	STR-5
Response Count	22
Denominator Total	26212
Submission Rate (n=33)	63.64%
Average	69.48%
Median	89.00%



Of the 21 LEMSAs reporting these data for 2014, the median number of patients transported directly to a Stroke center by ground ambulance was 93%, with a steady and significant increase over the past three years.

Direct transport of patients to a Stroke center will vary by geography and availability of resources in a given area. Lower values are expected in rural areas or jurisdictions that do not have an established system with designated specialty care hospitals or rapid access to a center in a neighboring jurisdiction.

An (*) represents the 22 LEMSAs that have a designated primary stroke receiving center. There are currently draft stroke regulations in the process of being finalized. The goal in a stroke system is to transport 100% of stroke patients to a designated stroke center.

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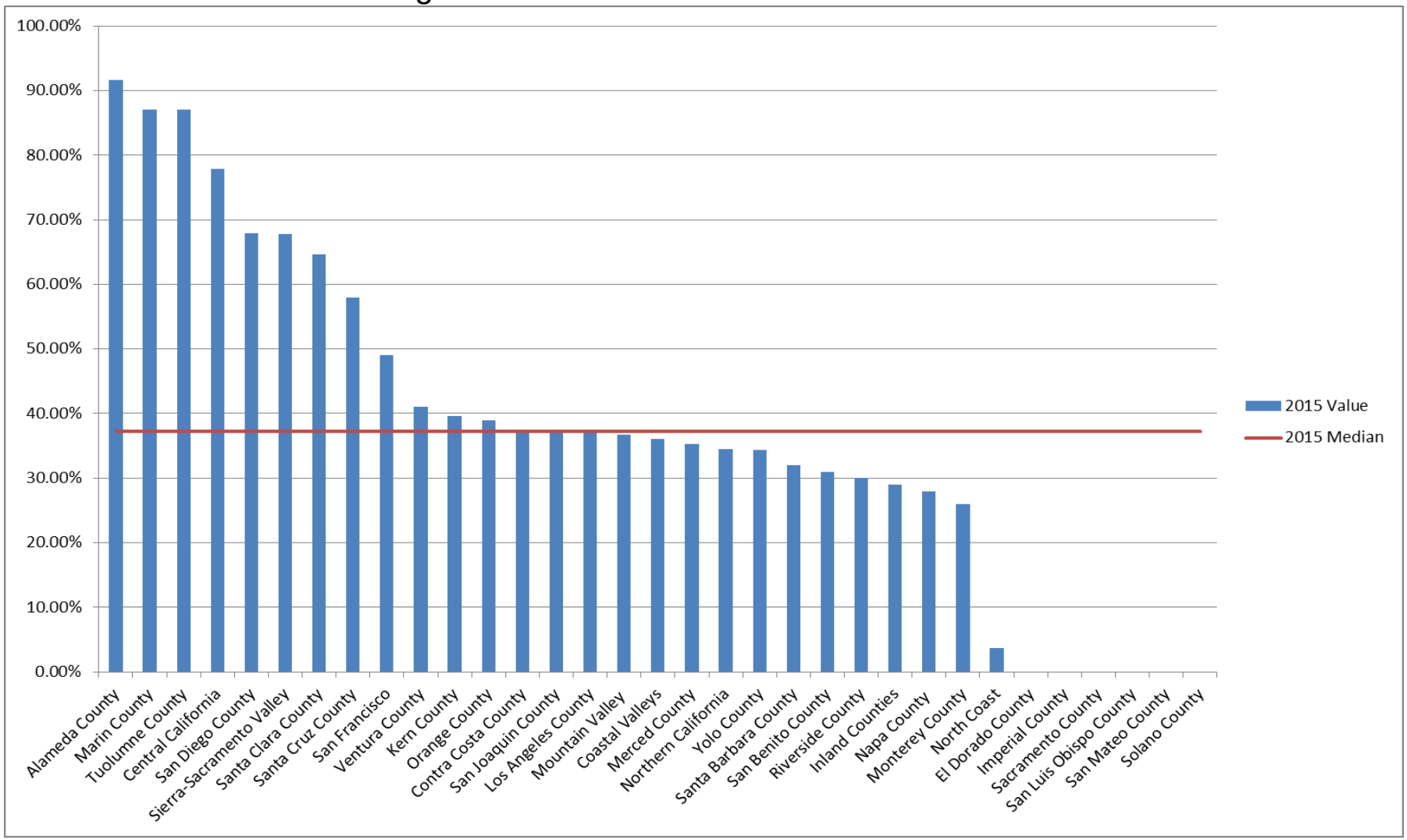
RES-2: Beta2 Agonist Administration for Adult Patients – Part 1 of 2



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RES-2: Beta2 Agonist Administration for Adult Patients – Part 2 of 2

	2015 Value	2015 Denom.
Alameda County	91.65%	3055
Marin County	87.00%	234
Tuolumne County	87.00%	149
Central California	77.89%	5514
San Diego County	67.88%	5897
Sierra-Sacramento Valley	67.83%	1753
Santa Clara County	64.62%	2332
Santa Cruz County	58.00%	200
San Francisco	49.00%	3175
Ventura County	41.00%	206
Kern County	39.62%	5813
Orange County	39.00%	2216
Contra Costa County	37.50%	7491
San Joaquin County	37.21%	6484
Los Angeles County	37.00%	22575
Mountain Valley	36.72%	4738
Coastal Valleys	36.00%	2520
Merced County	35.27%	3054
Northern California	34.48%	670
Yolo County	34.40%	1403
Santa Barbara County	32.00%	1449
San Benito County	31.00%	184
Riverside County	30.06%	16190
Inland Counties	29.00%	14258
Napa County	27.89%	1201
Monterey County	25.97%	2091
North Coast	3.70%	1415
El Dorado County		
Imperial County		
Sacramento County		
San Luis Obispo County		
San Mateo County		
Solano County		

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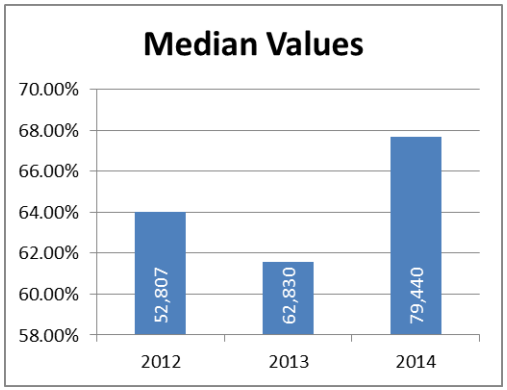
Measure ID	RES-2
Response Count	27
Denominator Total	116267
Submission Rate (n=33)	81.82%
Average	45.88%
Median	37.21%



Of the 29 LEMSAs reporting these data for 2014, the median percentage of patients receiving a Beta-2 Agonist/bronchodilator for bronchospasm in adults (age 14 or older) was 67%, an increase from 61.5% last year.

The marked variability for this measure suggests challenges identifying the appropriate denominator of patients for whom a bronchodilator is indicated.

Treatment protocols for which adult patients should receive Beta2 agonists may vary and clinical differentiation is difficult.

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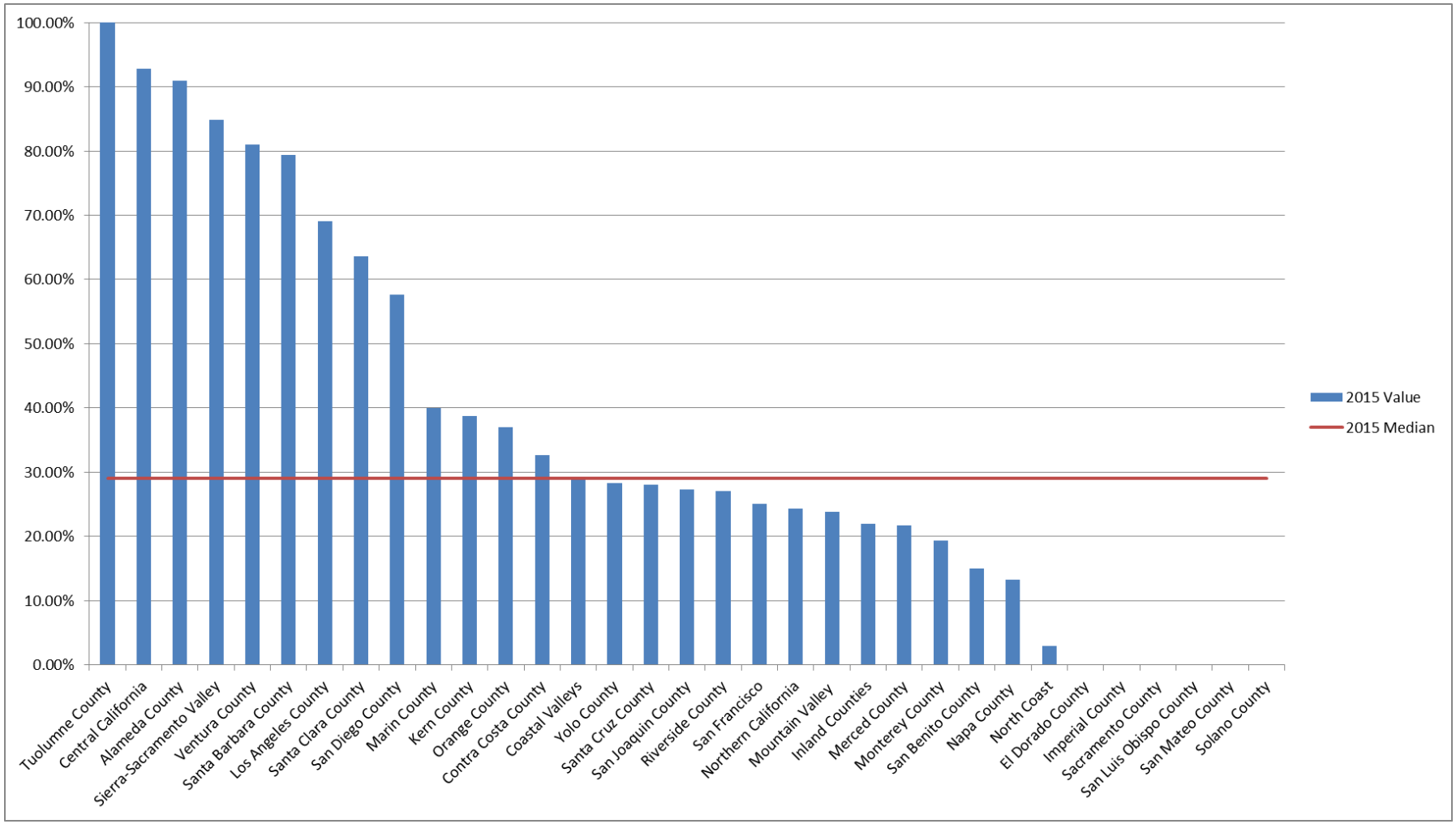
PED-1: Pediatric Patients With Wheezing Receiving Bronchodilators – Part 1 of 2



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PED-1: Pediatric Patients With Wheezing Receiving Bronchodilators – Part 2 of 2

	2015 Value	2015 Denom.
Tuolumne County	100.00%	3
Central California	92.86%	182
Alameda County	91.00%	120
Sierra-Sacramento Valley	84.86%	185
Ventura County	81.00%	21
Santa Barbara County	79.40%	34
Los Angeles County	69.00%	594
Santa Clara County	63.64%	110
San Diego County	57.60%	342
Marin County	40.00%	10
Kern County	38.67%	497
Orange County	37.00%	175
Contra Costa County	32.66%	502
Coastal Valleys	29.00%	163
Yolo County	28.30%	145
Santa Cruz County	28.00%	859
San Joaquin County	27.30%	663
Riverside County	27.09%	1399
San Francisco	25.00%	166
Northern California	24.32%	37
Mountain Valley	23.82%	340
Inland Counties	22.00%	1555
Merced County	21.71%	175
Monterey County	19.35%	186
San Benito County	15.00%	13
Napa County	13.23%	68
North Coast	2.90%	70
El Dorado County		
Imperial County		
Sacramento County		
San Luis Obispo County		
San Mateo County		
Solano County		

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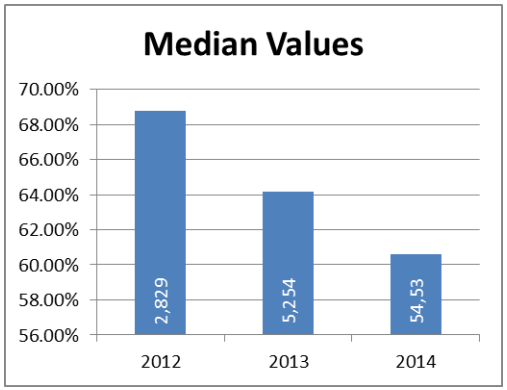
Measure ID	PED-1
Response Count	27
Denominator Total	8614
Submission Rate (n=33)	81.82%
Average	43.51%
Median	29.00%



Of the 29 LEMSAs reporting these data for 2014, the median number of pediatric patients receiving bronchodilators for asthma was 60.6%. The decrease over the last 3 years suggests methodological issues rather than performance. The pediatric measure should have more validity than the adult, since shortness of breath with wheezing in children is more likely due to asthma than adult symptoms that may be due to cardiac etiology. It is not clear why the spectrum of results would be so variable. One reason may be multiple doses administered at the home prior to arrival of EMS or dose administered by first responders. Examination of this measure is recommended to ensure proper patient inclusion and documentation.

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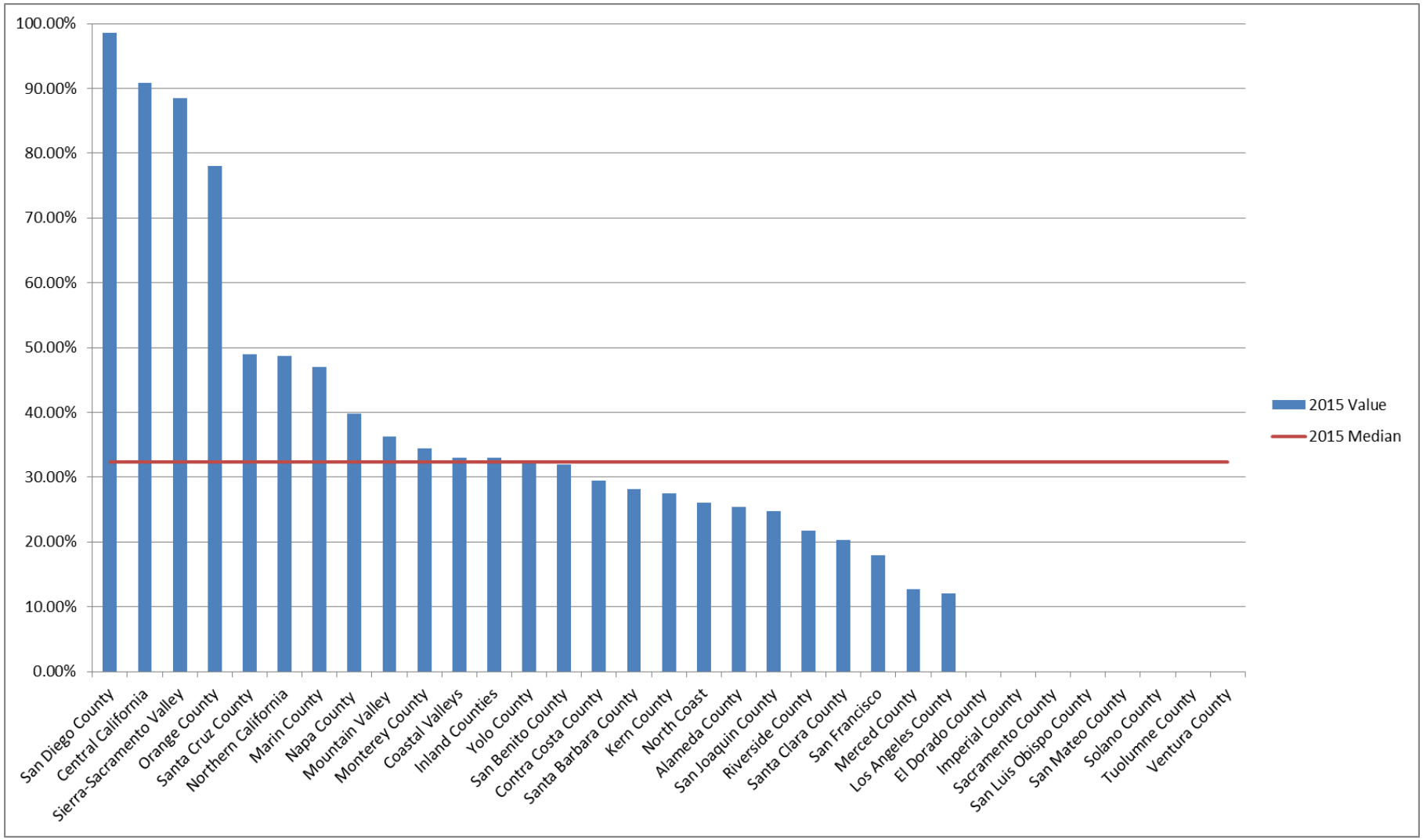
PAI-1: Pain Intervention – Part 1 of 2



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PAI-1: Pain Intervention – Part 2 of 2

	2015 Value	2015 Denom.
San Diego County	98.54%	1162
Central California	90.85%	2327
Sierra-Sacramento Valley	88.49%	4925
Orange County	78.00%	50
Santa Cruz County	49.00%	772
Northern California	48.64%	1252
Marin County	47.00%	1498
Napa County	39.85%	1764
Mountain Valley	36.27%	5046
Monterey County	34.41%	5310
Coastal Valleys	33.00%	4387
Inland Counties	33.00%	21132
Yolo County	32.40%	2833
San Benito County	32.00%	529
Contra Costa County	29.50%	15749
Santa Barbara County	28.10%	2334
Kern County	27.50%	15410
North Coast	26.10%	3875
Alameda County	25.44%	32310
San Joaquin County	24.79%	12848
Riverside County	21.80%	36151
Santa Clara County	20.32%	10320
San Francisco	18.00%	17569
Merced County	12.73%	2946
Los Angeles County	12.00%	48939
El Dorado County		
Imperial County		
Sacramento County		
San Luis Obispo County		
San Mateo County		
Solano County		
Tuolumne County		
Ventura County		

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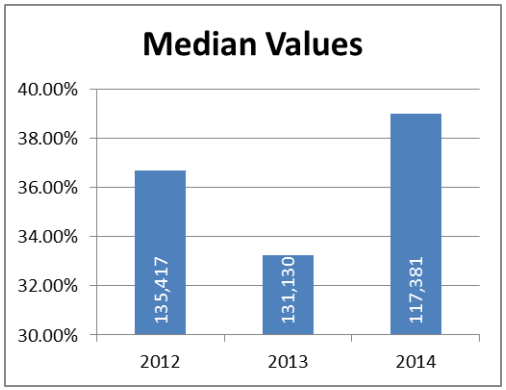
Measure ID	PAI-1
Response Count	25
Denominator Total	251438
Submission Rate (n=33)	75.76%
Average	39.51%
Median	32.40%



Of the 22 LEMSAs reporting these data for 2014, the median percentage of patients receiving intervention for any pain reported as 7 or greater on a 10-point pain scale was 39%. Pain intervention was defined as any analgesic medication or accepted procedure to reduce pain.

All paramedics have access to narcotics; however protocols for use may vary significantly. Some may have received pain medication from first responders. The wide variation deserves closer investigation.

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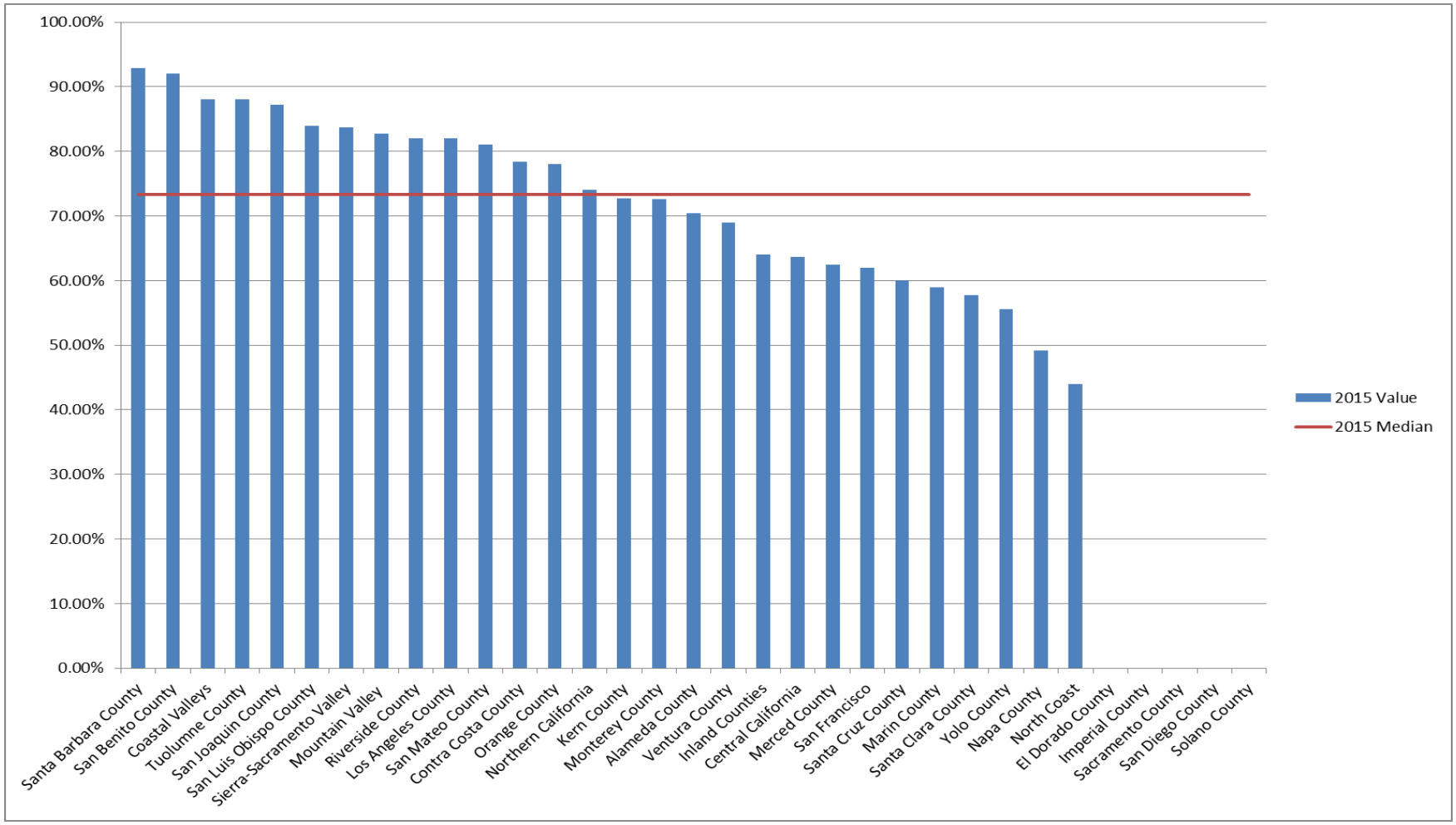
SKL-1: Endotracheal Intubation Success Rate – Part 1 of 2



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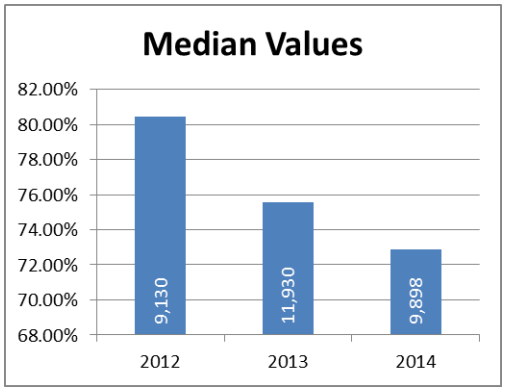
SKL-1: Endotracheal Intubation Success Rate – Part 2 of 2

	2015 Value	2015 Denom.
Santa Barbara County	92.90%	99
San Benito County	92.00%	13
Coastal Valleys	88.00%	104
Tuolumne County	88.00%	17
San Joaquin County	87.16%	335
San Luis Obispo County	84.00%	117
Sierra-Sacramento Valley	83.76%	425
Mountain Valley	82.71%	133
Riverside County	82.03%	1252
Los Angeles County	82.00%	1577
San Mateo County	81.00%	284
Contra Costa County	78.41%	315
Orange County	78.00%	264
Northern California	74.00%	50
Kern County	72.74%	642
Monterey County	72.60%	146
Alameda County	70.47%	789
Ventura County	69.00%	54
Inland Counties	64.00%	1328
Central California	63.72%	430
Merced County	62.41%	290
San Francisco	62.00%	234
Santa Cruz County	60.00%	70
Marin County	59.00%	56
Santa Clara County	57.70%	331
Yolo County	55.60%	18
Napa County	49.23%	65
North Coast	44.00%	191
El Dorado County		
Imperial County		
Sacramento County		
San Diego County		
Solano County		

Empty grey cells indicate no value reported

Measure ID	SKL-1
Response Count	28
Denominator Total	9629
Submission Rate (n=33)	81.82%
Average	72.73%
Median	73.37%



Of the 30 LEMSAs reporting these data for 2014, the median percentage of successful endotracheal intubations (within 2 attempts) was 72.9%. Endotracheal intubation success rate by paramedics in the field vary widely from 60-90% with an average of 72%, depending on methods, population and protocol.

It is unclear why this value has decreased over the past 3 years. Other methods of airway management have recently been shown to be as effective as intubation. It is important to monitor this measure to verify skill maintenance.

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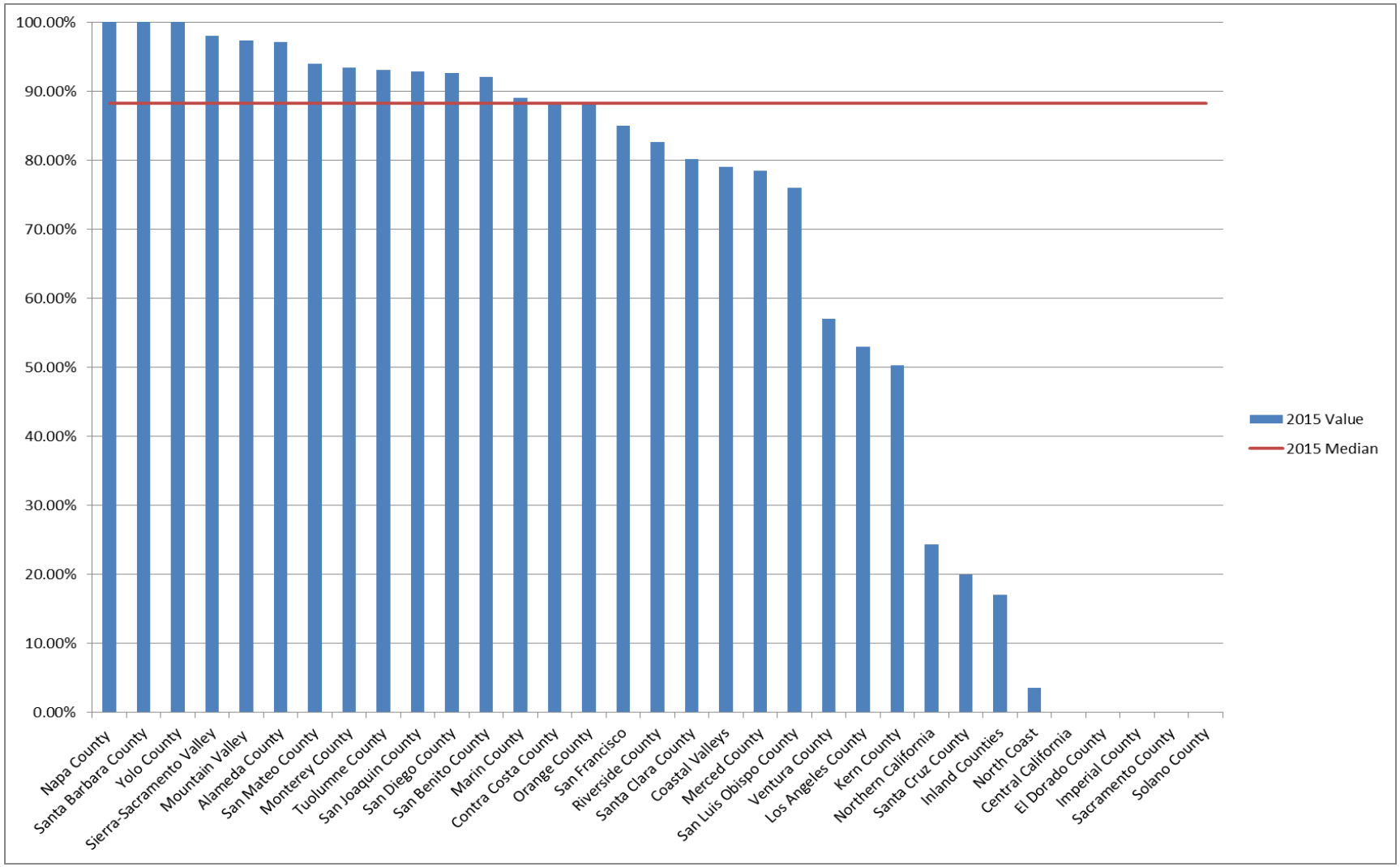
SKL-2: End-tidal CO2 Performed on any Successful Endotracheal Intubation – Part 1 of 2



Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource disparities, and inability to collect hospital outcome data. This retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

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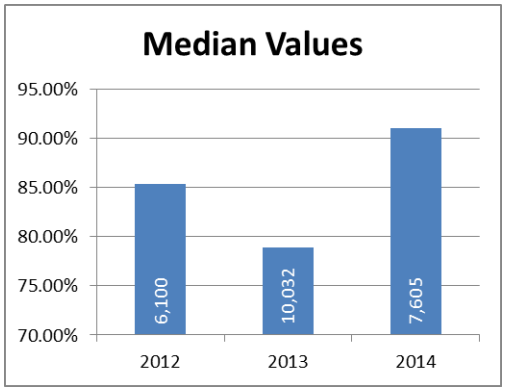
SKL-2: End-tidal CO2 Performed on any Successful Endotracheal Intubation – Part 2 of 2

	2015 Value	2015 Denom.
Napa County	100.00%	32
Santa Barbara County	100.00%	99
Yolo County	100.00%	10
Sierra-Sacramento Valley	98.03%	356
Mountain Valley	97.27%	110
Alameda County	97.12%	556
San Mateo County	94.00%	230
Monterey County	93.44%	106
Tuolumne County	93.00%	15
San Joaquin County	92.81%	292
San Diego County	92.56%	242
San Benito County	92.00%	12
Marin County	89.00%	112
Contra Costa County	88.50%	261
Orange County	88.00%	50
San Francisco	85.00%	144
Riverside County	82.58%	916
Santa Clara County	80.10%	191
Coastal Valleys	79.00%	91
Merced County	78.45%	181
San Luis Obispo County	76.00%	99
Ventura County	57.00%	37
Los Angeles County	53.00%	1378
Kern County	50.31%	642
Northern California	24.32%	37
Santa Cruz County	20.00%	40
Inland Counties	17.00%	847
North Coast	3.60%	84
Central California		
El Dorado County		
Imperial County		
Sacramento County		
Solano County		

Empty grey cells indicate no value reported

Measure ID	SKL-2
Response Count	28
Denominator Total	7170
Submission Rate (n=33)	81.82%
Average	75.79%
Median	88.25%



Of the 29 LEMSAs reporting these data for 2014, the median percentage of End-Tidal CO2 monitoring with waveform capnography after any successful endotracheal intubations was 91%. The value significantly increased from last year, but has been variable over the three years of measurement. Following clinical best practices, this indicator should be 100%, so it is important for local jurisdictions to evaluate whether this is documentation, a practice issue, or protocol deficiency.

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